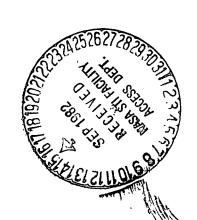
Energy
A Continuing
Bibliography
with Indexes

NASA SP-7043(33) April 1982

National Aeronautics and Space Administration



(NASA-SP-7043(33)) ENERGY, A CONTINUING BIBLIOGRAPHY WITH INDEXES. ISSUE 33 (NASA Scientific and Technical) 376 p HC \$15.00 CSCL 10A

Unclas

N82-32840

TOY ENERGY ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

ENERGY

EN

TO ENGRED ENGREDA

ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges.

STAR (N-10000 Series) N82-10001 - N82-16039

IAA (A-10000 Series) A82-10001 - A82-18839

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by PRC Government Information Systems

ENERGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

Issue 33

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced between January 1 and March 31, 1982 in

- · Scientific and Technical Aerospace Reports (STAR)
- · International Aerospace Abstracts (IAA).



INTRODUCTION

This issue of Energy: A Continuing Bibliography with Indexes (NASA SP-7043(33)) lists 1211 reports, journal articles, and other documents announced between January 1, 1982 and March 31, 1982 in Scientific and Technical Aerospace Reports (STAR) or in International Aerospace Abstracts (IAA). The first issue of this continuing bibliography was published in May 1974.

The coverage includes regional, national and international energy systems; research and development on fuels and other sources of energy; energy conversion, transport, transmission, distribution and storage, with special emphasis on use of hydrogen and of solar energy. Also included are methods of locating or using new energy resources. Of special interest is energy for heating, lighting, for powering aircraft, surface vehicles, or other machinery.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The entries are arranged in eight major categories, with *IAA Entries* preceding *STAR Entries* in each category. The citation, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR* including the original accession numbers from the respective announcement journals. This procedure, which saves time and money accounts for the slight variation in citation appearances.

Five indexes -- subject, personal author, corporate source, contract number, and report number -- are included.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A82-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service. American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies of accessions are available at \$8.00 per document. Microfiche⁽¹⁾ of documents announced in *IAA* are available at the rate of \$4.00 per microfiche on demand, and at the rate of \$1.35 per microfiche for standing orders for all *IAA* microfiche.

Minimum air-mail postage to foreign countries is \$2.50 and all foreign orders are shipped on payment of pro-forma invoices

All inquiries and requests should be addressed to AIAA Technical Information Service. Please refer to the accession number when requesting publications.

STAR ENTRIES (N82-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS Sold by the National Technical Information Service Prices for hard copy (HC) and microfiche (MF) are indicated by a price code preceded by the letters HC or MF in the STAR citation. Current values for the price codes are given in the tables on page vii.

Documents on microfiche are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, Va. 22161.

NOTE ON ORDERING DOCUMENTS When ordering NASA publications (those followed by the * symbol), use the N accession number NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number It is also advisable to cite the title and other bibliographic identification

Avail SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard \$4.00 price, for those documents identified by a # symbol.)

Avail: NASA Public Document Rooms Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Document Room (Room 126), 600 Independence Ave., S W., Washington, D C 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

⁽¹⁾ A microfiche is a transparent sheet of film 105 by 148 mm in size containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26.1 reduction)

- Avail DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.
- Avail: Univ Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm All requests should cite the author and the Order Number as they appear in the citation.
- Avail. USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.
- Avail. HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.
- Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown (If none is given, inquiry should be addressed to the BLL)
- Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).
- Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.
- Avail: U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of 50 cents each, postage free.
- Other availabilities If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

GENERAL AVAILABILITY

All publications abstracted in this bibliography are available to the public through the sources as indicated in the STAR Entries and IAA Entries sections. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publication inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA. A listing of public collections of NASA documents is included on the inside back cover.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics and Astronautics Technical Information Service 555 West 57th Street, 12th Floor New York, New York 10019 National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161

British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England Pendragon House, Inc. 899 Broadway Avenue Redwood City, California 94063

Commissioner of Patents and Trademarks U.S. Patent and Trademark Office Washington, D.C. 20231 Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402

Department of Energy Technical Information Center P.O. Box 62 Oak Ridge, Tennessee 37830 University Microfilms A Xerox Company 300 North Zeeb Road Ann Arbor, Michigan 48106

ESA-Information Retrieval Service ESRIN V1a Galileo Galilei 00044 Frascati (Rome) Italy University Microfilms, Ltd. Tylers Green London, England

Fachinformationszentrum Energie, Physik, Mathematik GMBH 7514 Eggenstein Leopoldshafen Federal Republic of Germany

U.S. Geological Survey 1033 General Services Administration Building Washington, D.C. 20242

Her Majesty's Stationery Office P.O. Box 569, S.E. 1 London, England

U.S. Geological Survey 601 E. Cedar Avenue Flagstaff, Arizona 86002

NASA Scientific and Technical Information Facility P.O. Box 8757 B.W.I. Airport, Maryland 21240

U.S. Geological Survey 345 Middlefield Road Menlo Park, California 94025

National Aeronautics and Space Administration Scientific and Technical Information Branch (NST-41) Washington, D.C. 20546

U.S. Geological Survey Bldg. 25, Denver Federal Center Denver, Colorado 80225

NTIS PRICE SCHEDULES

Schedule A STANDARD PAPER COPY PRICE SCHEDULE

(Effective January 1, 1982)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	\$ 400	\$ 8.00
A02	001-025	6 00	12 00
A03	026-050	7 50	15 00
A04	051-075	9 00	18 00
A05	076-100	10 50	21.00
A06	101-125	12 00	24 00
A07	126-150	13 50	27 00
A08	151-175	15 00	30.00
A09	476-200	16 50	33.00
A10	201-225	18.00	36 00
A11	226-250	19 50	39 00
A12	251-275	21 00	42 00
A13	276-300	22 50	45 00
A14	301-325	24 00	48 00
A15	. 326-350	25 50	51 00
A16	351-375	27 00	54 00
A17	376-400	28 50	57 00
A18	401-425	30 00	60 00
A19	426-450	31 50	63 00
A20	451-475	33 00	66 00
A21	476-500	34 50	69 00
A22	501-525	36 00	72 00
A23	526-550	37 50	75 00
A24	551-575	39 00	78 00
A25	576-600	40 50	81 00
	601 -up	1/	2/

A99 - Write for quote

- 1/ Add \$1 50 for each additional 25 page increment or portion thereof for 601 pages up.
- 2/ Add \$3.00 for each additional 25 page increment or portion thereof for 601 pages and more

Schedule E EXCEPTION PRICE SCHEDULE

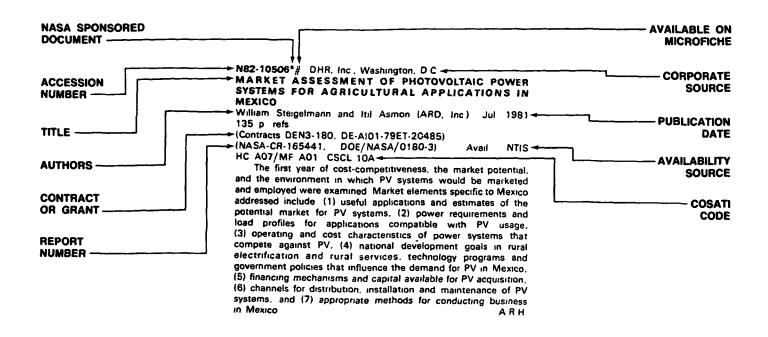
Paper Copy & Microfiche

Price	North American	Foreign
Code	Price	Price
E01	\$ 650	\$ 13 50
E02	7 50	15 50
E03	9 50	19 50
E04	11 50	23 50
E05	13 50	27 50
E06	15 50	31 50
E07	17 50	35 50
E08	19 50	39 50
E09	21 50	43 50
E10	23 50	47 50
E11	25 50	51 50
E12	28 50	57 50
E13	31 50	63 50
E14	34 50	69 50
E15	37 50	75 50
E16	40 50	81 50
E17	43 50	88 50
E18	46 50	93 50
E19	51 50	102 50
E20	61 50	123 50
E-99 - Write for quote		
ND1	30 00¹	45 00

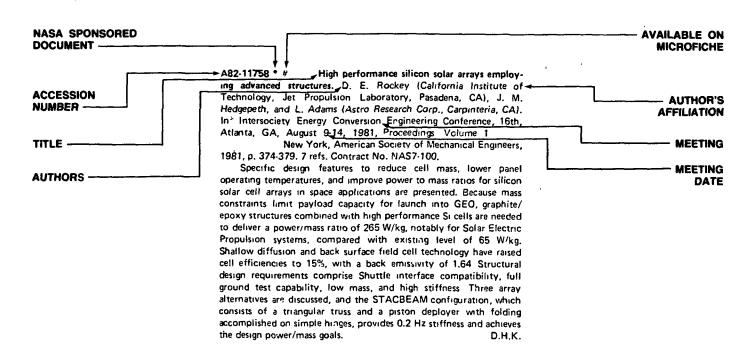
TABLE OF CONTENTS

,	Page	
Category 01 Energy Policies and Energy Systems Analysis Includes energy requirements, energy conservation, and environmental impacts of energy systems.	1	
Category 02 Solar Energy Includes solar collectors, solar cells, solar heating and cooling systems, and solar generators.	37	
Category 03 Hydrogen Includes hydrogen production, storage, and distribution.	83	
Category 04 Fuels and Other Sources of Energy Includes fossil fuels, nuclear fuels, geothermal, ocean thermal, tidal, and wind energy, and biomass energy production.	89	
Category 05 Energy Conversion Includes thermomechanical, thermoelectric, geothermal, ocean thermal, and wind energy conversion. Also includes nuclear reactors, magneto-hydrodynamic generators, and fuel cells.	121	
Category 06 Energy Transport, Transmission, and Distribution Includes transport of fuels by pipelines, tubes, etc., microwave power transmission, and superconducting power transmission.	145	
Category 07 Energy Storage Includes flywheels, heat storage, underground air storage, compressed air, and storage batteries.	153	
Category 08 General	161	
Subject Index	A-1	
Personal Author Index	B-1	
Corporate Source Index		
Contract Number Index		
Report / Accession Number Index	E-1	

TYPICAL CITATION AND ABSTRACT FROM STAR



TYPICAL CITATION AND ABSTRACT FROM IAA



A Listing of Energy Bibliographies Contained in This Publication:

,1. Amorphous silicon - Introduction	p0053 A82-13737
2. Alcohol fuels bibliography, 1901 - March 1980	p0095 N82-10263
3. Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts	p0009 N82-10608
4. Bibliography of the seasonal thermal energy storage library	p0159 N82-12586
5. Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic-fuels production	p0021 N82-12673
6. Bibliography of publications dealing with tar sands	p0115 N82-14594

Includes energy requirements, energy conservation, and environmental impacts of energy systems.

A82-10495 # Characteristics and trends of energy consumption in transport missions with aircraft and surface vehicles (Caratteristiche e tendenze del consumo energetico nelle missioni di trasporto con aeroplani e con veicoli di superficie). G Gabrielli Ingegneria, July-Aug 1981, p 193-198. 6 refs In Italian

A nondimensional factor is defined which characterizes energy consumption in transport missions. Values of this energy utilization factor are given for a number of aircraft and surface vehicles (e.g., automobiles, buses, and trains). Particular attention is given to the energy utilization factor of turbofan and turbojet aircraft

B.J.

A82-10697 Fingerprinting pollutant discharges from synfuels plants. K J Bombaugh and K W. Lee (Radian Corp., Austin, TX) Environmental Science and Technology, vol. 15, Oct 1981, p. 1142-1149. 11 refs Research sponsored by the U.S. Environmental Protection Agency.

An approach to the identification of ambient aerosols produced a coal gasification plant based on their organic chemical composition is discussed. The method has been field tested successfully in the region of the Lurgi process plant in the Kosovo region of Yugoslavia, which produces four major liquid by-products: naphtha, medium oil, tar and crude phenol. In the study, gas chromatography in both the sulfur and nitrogen modes and gas chromatography/mass spectroscopy with selective ion scanning was used to detect the presence of the medium oil characteristics in chromatograms of ambient aerosols and vapors collected over a 16-day period at five locations approximately 1-2 km from the plant. With the aid of a calibration curve expressing the relation between GC retention time and boiling point for various compounds, chromatograms of the medium oil component were found to be similar to those gathered downwind of the plant Comparisons between the chromatograms of nitrogen species in samples of water-soluble organics from the Kosovo plant and from a Chapman-Wilputte gasifier using Virginia bituminous coal also demonstrate the potential utility of the technique for differentiating between chemically similar emissions from different sources

A82-10875 Characteristics of combustion and pollutant formation in swirling flames. T Takagı and T. Okamoto (Osaka University, Suita, Japan). Combustion and Flame, vol. 43, Oct. 1981, p. 69-79, 24 refs.

The gas species concentrations and temperatures in a flame formed around a fuel jet surrounded by a swirling air flow are presented. Particular attention is given to the interrelation between the flame structure and the formation and emission characteristics of air pollutants. Two typical flame configurations are found to arise according to the primary air ratio: the type A flame has a low primary air ratio, increased NO(x) is formed in the flame and appears in the exhaust because the fuel layer burns at a relatively high temperature and the slow mixing retards the temperature decay. Low NO(x) formation occurs in the type B flame, which has a high primary air ratio, the fuel layer around the recirculation zone burns

APRIL 1982

at a relatively low temperature as a result of dilution by excess air prior to combustion. Unburnt hydrocarbons are liable to be exhausted because hydrocarbons in the fuel layer around the recirculation zone, excessively diluted by the surrounding air, spill away through the circumferential part of the bulk flow Hydrocarbons are not exhausted, however, when the total air ratio is less than two. Effects of a wide range of parameters on NO(x), CO, and hydrocarbon emissions are examined in connection with the flame configurations.

J.F.

A82-11540

Annual review of energy, Volume 6, Edited by J. M. Hollander (California, University, Berkeley, CA), M. K. Simmons (General Electric Co., Schenectady, NY), and D. O. Wood (MIT, Cambridge, MA). Palo Alto, CA, Annual Reviews, Inc., 1981 559 p. \$20.

Developments in the areas of energy resources and supply technologies, energy end use and conservation, energy policy, energy-related risks and the sociopolitical aspects of energy are reviewed. Progress in solar energy technologies over the last five years is discussed, along with the implications for reactor safety of the accident at Three Mile Island, the derivation of biomass fuels from agricultural products and the application of probabilistic risk assessment to energy technologies. Attention is also given to a program for national survival during an oil crisis, energy conservation in new buildings, the development of a United States synthetic fuel industry, the role of OPEC policies in world oil availability, the social impacts of soft and hard energy systems, and the energy implications of fixed rail mass transportation systems. Additional topics include the energy consumptions of industries, the relative economics of nuclear, coal and oil-fired electricity generation, and the role of petroleum price and allocation regulations in the management of energy shortages.

A82-11542 Agricultural policies and biomass fuels. S. Flaim and D. Hertzmark (Solar Energy Research Institute, Golden, CO). In: Annual review of energy. Volume 6. Palo Alto, CA, Annual Reviews, Inc., 1981, p. 89-121, 64 refs.

The potentials for biomass energy derived from agricultural products are examined. The production of energy feedstocks from grains is discussed for the example of ethanol production from grain, with consideration given to the beverage process and the wet milling process for obtaining fuel ethanol from grains and sugars, the nonfeedstock costs and energy requirements for ethanol production. the potential net energy gain from ethanol fermentation, the effect of ethanol fuel production on supplies of protein, oils and feed and of ethanol coproducts, net ethanol costs, and alternatives to corn as an ethanol feedstock. Biomass fuel production from crop residues is then considered, the constraints of soil fertility on crop residue removal for energy production are reviewed, residue yields with conventional practices and with reduced tillage are determined, technologies for the direct conversion of cellulose to ethanol and methanol are described, and potential markets for the products of these processes are identified. Implications for agricultural policy of ethanol production from grain and fuel and chemical production from crop residues are also discussed. A.L.W.

A82-11543 Factors in the development of a major US synthetic fuels industry. H. Perry and H. H. Landsberg (Resources for the Future, Inc., Washington, DC) In: Annual review of energy. Volume 6. Palo Alto, CA, Annual Reviews, Inc., 1981, p. 233-266. 48 refs. Contract No. ER-78-C-01-6654

Conditions necessary for the development of a successful synthetic fuels industry in the United States which would reduce

dependence on imported liquid fuels are examined. Attention is given to the legislative background, the current status of alternative synfuels technologies including coal gasification, coal liquefaction, oil shale, and biomass conversion, resource requirements, environmental and socioeconomic constraints, and economic factors. Estimates are also presented of the rate of commercialization to be expected at various levels taking into account both physical and nonphysical constraints, and it is concluded that the rate of commercialization of synthetic fuels production should increase rapidly after the 1990s after the demonstration of technologies acceptance of regulatory requirements, and development of the required technological infrastructure.

A82-11845 # Energy conservation through utilization of mechanical energy storage. D. B Eisenhaure, T E. Bliamptis, J. R. Downer, and P C Heinemann (Charles Stark Draper Laboratory, Inc., Cambridge, MA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2154-2160

Potential benefits regarding fuel savings, necessary technology, and evaluation criteria for the development of flywheel-hybrid vehicles are examined. A case study is quoted in which adoption of flywheel-hybrid vehicles in a taxi fleet would result in an increase of 10 mpg average to 32 mpg. Two proposed systems are described, one involving direct engine power to the flywheel and the second regenerating the flywheel from braking energy through a continuously variable transmission. Fuel consumption characteristics are considered the ultimate determinant in the choice of configuration, while material properties and housing shape determine the flywheel speed range. Vehicle losses are characterized and it is expected that a flywheel at 12,000 rpm will experience less than one hp average parasitic power loss. Flywheel storage is suitable for smaller engines because larger engines dominate the power train mass Areas considered important for further investigation include reliability of an engine run near maximum torque, noise and vibration associated with flywheel operation, start up delays, compatibility of driver controls, integration of normal with regenerative braking systems, and, most importantly, the continuously variable transmission.

MSK

A82-12156 The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere. G I Pearman and P Hyson (Commonwealth Scientific and Industrial Research Organization, Div. of Atmospheric Physics, Mordialloc, Victoria, Australia). Journal of Geophysical Research, vol 86, Oct 20, 1981, p. 9839-9843. 28 refs NOAA-supported research

Records of the annual variation of the atmospheric carbon dioxide concentration at Mauna Loa, Point Barrow, and Weathership P are examined for secular changes. The amplitude of the annual variation appears to have increased in recent years with a best estimate of the rate of change, based on the Mauna Loa data, of 0.45 + or - 0.42%/yr This change is discussed in terms of changes in biospheric respiration and photosynthesis and the use of fossil fuels The analysis does not allow for the separation of several possible causes of amplitude change. However, if the change is interpreted as reflecting enhanced biospheric growth, the effect is equivalent to a 8% change in the net summer uptake of carbon over the years 1959-1978 and to a growth of the Northern Hemisphere seasonal biosphere of 500-billion kg of carbon per year. Such a conclusion is consistent with recent inventory studies, which indicate that temperate zone forests have acted as a net sink of about 10-trillion kg of carbon per year in recent decades (Author)

A82-12505 # Environmental factors of power satellites. Y. T Chiu and B. K Ching (Aerospace Corp., Space Sciences Laboratory, El Segundo, CA). In. International Scientific Conference on Space, 21st, Rome, Italy, March 25, 26, 1981, Proceedings.

Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1981, p. 43-52. 16 refs

The paper delineates environmental factors associated with the construction and operation of a solar power satellite, with emphasis on the idea that these factors should play a central, not a subsidiary, role in defining the limits of the system. Particular attention is given

to the biospheric environment (the ground level and troposphere), including launch-site effects and rectenna site effects, the upper atmospheric environment (tropopause to turbopause), and the near-space environment (turbopause to magnetopause), including HLLV exhausts and the F region, spacecraft emissions in the magnetosphere, and possible interactions of the microwave beam with the ionosphere B.J.

A82-12547 Energy future: Prophets, profits and policies; Proceedings of the Seventh Annual UMR-DNR Conference on Energy, University of Missouri-Rolla, Rolla, MO, October 14-16, 1980. Volume 7. Conference sponsored by the Missouri Department of Natural Resources and University of Missouri-Rolla, Edited by J. D Morgan (Missouri-Rolla, University, Rolla, MO). Rolla, MO, University of Missouri-Rolla, 1981. 344 p \$30.

Topics covered include industrial energy systems, bromass use, and energy management. Papers were presented on photovoltaic and wind electric systems, energy considerations in building design and standards, political and social aspects of energy systems, energy research technology, and environmental impacts of various hydrocarbon based fuel systems.

M S K.

A82-12563 Fuel conservation - DC-9 series 20/30/40. Society of Flight Test Engineers, Journal, vol 3, Sept. 1981, p. 2-17.

Operational performance penalties and approximate fuel costs associated with the aerodynamics, flight operations, fuel gage system and performance analysis aspects of the DC-9 Series 20, 30 and 40 aircraft are presented. Degradations in aerodynamic cleanness, caused by the gradual deterioration of various seals, rigging adjustments and skin surface smoothness, are shown to lead to drag increases of less than 0.5%, which, however, represents a significant cost in view of the amount of fuel consumed. Flying off-optimum altitude or Mach number may result in excess fuel expenditures greater than those due to degraded aerodynamic cleanness. Other operational factors with substantial influence on fuel use include fuel or aircraft weight, center of gravity, flight time, the use of automatic flight control systems, APU operation, engine starting times, takeoff procedures, climb speed, en route profile, descent profile, and approach maneuvers. The DC-9 fuel gage system has been designed to be as accurate as possible in all phases, in order to minimize the necessity of carrying excess fuel for a given flight. Finally, investigations of aircraft performance may be used to identify areas requiring correction through the comparison of the indicated performance level against a reference, the assessment of engine and airframe contributions, and the investigation of the most likely areas for correction - the external control surfaces and internal systems. S.C.S.

A82-13078 Fuel efficient flight profiles in an ATC flow management environment. R. W Schwab (Boeing Commercial Airplane Co., Seattle, WA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1

New York, American Institute of Chemical Engineers, 1981, 6 p. (WA-1B).

The Flow Management research program was established to define the airborne navigation/guidance capabilities needed for efficient operation in the ATC Flow Management system under development, the Flow Management research is one element of the NASA Terminal Configured Vehicle program. This paper examines the Flow Management algorithms, and reviews in-plane geometry and ATC constraints, wind and temperature modeling, descent initialization, runway profile descent calculation, aeroperformance envelope determination, high profile descent calculation, and holding and path stretching.

A82-13457 # The role of avionics in the all electric airplane. M J Cronin (Lockheed-California Co., Burbank, CA) In: Digital Avionics Systems Conference, 4th, St Louis, MO, November 17-19, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1981, p 47-55. 22 refs. (AIAA 81-2219)

The paper examines the role of avionics in the development of the all-electric airplane (AEP) as a viable and energy-efficient transport. It is noted that avionics will play a key role in the fuel and thrust management of the advanced-technology engines of the AEP via technology such as FADEC (full authority digital engine control) Attention is also given to the important role of avionics in the flight control of future AEPs, operating with a relaxed static stability and advanced supercritical wings. The samarium-cobalt motor/generator development and the proliferating use of power electronics for engine starting/motor control are also discussed.

A82-14006 # Analysis of electric utility investments into wind power. F. March, E. H. Dlott, and R. C. McArthur (Arthur D. Little, Inc., Cambridge, MA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2537. 9 p.

This paper uses a synthetic utility typical of the northeast United States, to evaluate an investment into 1000 MW of wind power, as a fuel saver, in the mid-1980s. The results of models that simulate the production cost savings, and the financial implications to the regulated utility are displayed. Under current regulatory and financial market conditions, an investor owned utility has no incentive to invest in wind energy, particularly when the technology is considered risky. A series of policy changes affecting the regulatory rules under which the utility operates are explored using the financial model to measure common stock issued, bond coverage, allowance for funds during conservation as percent of earnings, and cost to consumer. These results are projected over a 15 year period, providing insight into which policies are likely to result in effective incentives for wind energy investment. (Author)

A82-14009 # Siting and land-use considerations in wind energy development. R J Noun (Solar Energy Research Institute, Golden, CO) American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec 1-3, 1981, Paper 81-2541. 9 p 43 refs.

Public and private issues affecting land-use requirements for the development of wind energy farms in the 30 kW to 3 MW range are discussed Private concerns comprise agreements between owners of adjacent property, while public issues concentrate on legislative acts to protect wind energy access, minimizing land development restrictions in areas next to wind farms is the primary focus. Existing (one, 600 kW - 20 turbines), under construction, and planned wind farms are described, noting that a small difference in wind speeds can have a large effect on the economics of wind farms. Windpower is divided into quantity (the effect of turbulence on windspeed), and quality (the effect of turbulence on the lifetime of the wind turbine structure), the factors have a large impact on the physical array design of a wind farm and the life expectancy of a wind turbine Measurement on a 200 kW Mod OA indicated wake turbulence clearance at 5 rotor diameters, although 20% velocity deficits were observed at 7 diameters. State legislative action to protect wind easement is reviewed, with private agreements providing specific binding clauses for airspace and wind rights between two landowners viewed as the best method M.S K

A82-14021 i Florida's proposed OTEC pilot plant for Key West. D L Block, L Rotundo (Florida Solar Energy Center, Cape Canaveral, FL), A. Griffin (TRW, Inc., Redondo Beach, CA), and T. Kelly (City Electric System, Key West, FL) American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2563 6

A description of the organizational structure, resource, and plant design for an OTEC system near Key West, Fla, is presented. A consortium of government offices has contracted with individual industrial developers to form an initial design team and manage subcontracting. Key West was chosen because of high electric rates, a proximity to warm and deep seawater, and a cooperative utility. Ocean water temperatures range from 80 F for the surface to 42 F for deep waters. A 40 MWe pilot plant is planned, with a double hull design for the 600-700 ft by 100-200 ft barge, four 15 MWe power modules will use ammonia as a working fluid. Strong available currents have reduced the needed sizes of the surface water intake ducts, less than two weeks down time are projected for hurricanes The fiber reinforced composite cooling water pipe will be 2,600 ft long and designed to withstand hurricane stresses. Mooring and power delivery cabling are described, and it is noted that the design for the Key West plant is transferable to anywhere in the world due to the built-in engineering considerations

A82-14024 # An estimate of OTEC costs, market potential and proof-of-concept vessel financing. R Manley, J Bluestein (Mitre Corp., McLean, VA), and E. J. Francis (Johns Hopkins University, Laurel, MD) American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2567 14 p. 7 refs

The cost and financing alternatives for the OTEC proof-ofconcept experimental vessel and analysis of likely future markets for the technology are discussed. Financing alternatives include the benefits of 1980 legislation favoring OTEC investments as well as application of well known project financing techniques. Estimates of the cost of electricity to be provided by large-scale OTEC plants in the late 1980s are made and projections of OTEC's future competitiveness are offered. Additionally, estimates of OTEC's contribution to the industrial power market through OTEC plantship applications are made. Near-term investments in OTEC proof-of-concept vessels appear favorable under the financial conditions assumed and should be more favorable under the Economic Tax Recovery Act of 1981 The long-term contributions which OTEC could make to the nation's energy supply and the consequent reductions in import of foreign oil are substantial, if the technology is allowed to mature to full-scale (Author)

A82-14040 # Turboexpanders for OTEC power plants. J Holm (Rotoflow Corp., Los Angeles, CA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2592. 13 p 9 refs

Centripetal (radial inflow) turboexpanders are well adapted to energy conservation schemes. A mini OTEC demonstration program, completed in 1979, uses a closed ammonia cycle to drive a 50 kw turboexpander generator unit. The turboexpander, which incorporates mechanical designs of low temperature and high speed machinery, has very high levels of reliability and efficiency. Stiff shaft designs have eliminated shaft and bearing criticals in the entire operating range. Rotor resonance problems are almost totally eliminated, and thrust bearing problems can be accurately monitored and controlled. Condensing streams and dust in gas can also be handled without erosion. Designs for radial inflow turboexpanders in sizes up to 70 MWe are presently available for use in OTEC and other power plants.

A82-14347 * Chronic exposure of a honey bee colony to 2.45 GHz continuous wave microwaves. B B. Westerdahl and N. E. Gary (California, University, Davis, CA). Space Solar Power Review, vol. 2, no 3, 1981, p. 283-295 8 refs. Research supported by the U.S. Department of Energy, Contract No. NAS2-9539.

A honey bee colony (Apis mellifera L.) was exposed 28 days to 2.45 GHz continuous wave microwaves at a power density (1 mW/sq cm) expected to be associated with rectennae in the solar power satellite power transmission system. Differences found between the control and microwave-treated colonies were not large, and were in the range of normal variation among similar colonies. Thus, there is an indication that microwave treatment had little, if any, effect on (1) flight and pollen foraging activity, (2) maintenance of internal colony temperature, (3) brood rearing activity, (4) food collection and storage, (5) colony weight, and (6) adult populations. Additional experiments are necessary before firm conclusions can be made

(Author)

A82-14404 Renewables in the U.S. energy future - How much, how fast, J P Holdren (California, University, Berkely, CA). Energy (UK), vol 6, Sept 1981, p 901-916. 40 refs

Comparisons are made of various projections of the contribution of several energy sources to the U S energy mix in the year 2000, along with conclusions on the effects of methods used to choose which systems receive emphasis. It is shown that energy-economic models predict renewable contributions of 1.5-24% of the total to be needed, depending on the set of assumptions utilized by the analyst and the definitions of renewable that were used. All studies showed a decoupling of energy consumption growth rates from an increase of economic growth, and a lessening of the rate of building large, conventionally fueled power plants. Scenarios making similar projections on the total use of renewables differed as to which technologies would make the contribution. Examples are provided for the use of

solar heating and thermoelectric conversion, wind, photovoltaics, OTEC, and biomass, and it is concluded that, while many energy futures are possible, the use of economics alone as a basis does not reflect the total cost of any particular energy system.

D.H.K.

A82-14416 Wing design for light transport aircraft with improved fuel economy. D. Welte, R. Birrenbach, and W. Haberland (Dornier GmbH, Friedrichshafen, West Germany). Zeitschrift fur Flugwissenschaften und Weltraumforschung, vol. 5, Sept.-Oct. 1981, p. 294-303 5 refs. Research supported by the Bundesministerium fur Forschung und Technologie.

Investigations related to the development of a new wing for a light transport aircraft were initiated by a German aerospace company in 1975. Flight tests for the evaluation of the new wing began in June 1979. The considered design incorporates a new wing section and a wing tip having a triangular shape. The induced drag observed in connection with the new wing tip is less than the corresponding value found for wing tips of conventional design. Tradeoff studies were conducted to optimize wing area and wing aspect ratio for the specified performance requirements. A use of the new wing design makes it possible to obtain aircraft with high maximum-lift values, low drag, and good stall characteristics. Attention is given to the wing parameter study, aspects of airfoil design, the flap design, the wing design, the aileron, and the merits of a number of different wing structures.

A82-14442 Evaporative hydrocarbon emissions from a large vehicle population. P. F. Nelson (Commonwealth Scientific and Industrial Research Organization, Div. of Fossil Fuels, North Ryde, New South Wales, Australia). Air Pollution Control Association, vol. 31, Nov. 1981, p. 1191-1193. 13 refs. Research supported by the SPCC of New South Wales.

Results of measurements of hydrocarbon emissions from parked cars in Sydney, Australia are presented. Concentrations of ethylene, acetylene, propylene, i-butane, n-butane, i-pentane, and n-pentane were determined for gasoline vapor, totally evaporated gasoline, and exhaust sources. Field samples were taken from the sole exhaust duct of an underground parking garage, and concentrations of each pollutant were obtained for the flow rate, emission rate for each source, and the weight fraction of the hydrocarbon species in the source. The hydrocarbons were identified by chromatography and the results were used to obtain solutions for the three sources by a least squares method. Comparisons of species concentration in the garage exhaust with the reference concentrations for the three sources indicated that evaporated gasoline was the pollutant source. with an average emission of 9.9 g/car, implying that evaporated gasoline from parked cars is a significant source of hydrocarbon emissions. M.S.K.

A82-14709 The all electric airplane - Its development and logistic support. M. J. Cronin (Lockheed-California Co., Burbank, CA). In: NAECON 1981, Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-21, 1981. Volume 1.

New York, Institute of Electrical and Electronics Engineers, Inc., 1981, p. 241-247. 19 refs.

Developmental and logistic support aspects that must be considered as a part of the development-cycle of potentially large electric power systems are reviewed. Increasing fuel problems and their impact on the economic viability of commercial airlines are discussed. The hardware design, power generation system, environmental control system, and the engine starting system are also discussed. In addition, the impact of these large electric power systems on ground logistic support and operation from ground power units, auxiliary power units, and fixed-plant installations is considered.

D.L.G.

A82-14924 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980. Edited by R. F. Hill. Washington, DC, Government Institutes, Inc., 1980. 1600 p. \$45.

Papers were presented on energy policy, including U.S. energy policy, world energy use, and Mexican, Canadian, and European energy perspectives. Topics were discussed in energy analysis, planning, and regulation, and effective energy use was examined in terms of energy management, cogeneration, energy efficient build-

ings, heat recovery systems, and solar sources and heat pumps. Specific attention was paid to energy saving methods for combustion heat sources, electric and advanced automobile engines, and synfuels programs. Fuel cells were investigated, along with prospects and problems in nuclear electric generation, enhanced oil recovery, and solar passive, thermoelectric, and photovoltaic systems. Finally, OTEC systems were explored, as were specific and regional biomass programs, peat and methane fuels, large wind turbine siting techniques and projects, and present and future solar instrumentation.

M.S.K

A82-14925 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981. Edited by R F. Hill (Bridgeport, University, Bridgeport, CT). Rockville, MD, Government Institutes, Inc., 1981. 1472 p. \$48.

Papers were presented on energy analysis, planning, and regulation, noting lead times necessary for energy systems development, the socioeconomic and environmental effects of energy systems, and utility planning procedures. Effective energy use was considered in terms of utility load management, cogeneration, conservation, heat pumps, and heat recovery methods. Technologies for exploitation of fossil, geothermal, and nuclear resources were discussed, with attention given to synthetic tuels, tuel cells, and fusion prospects. Finally renewable energy resources were examined regarding solar building heat systems, economics, solar pond performance, biomass, alcohol, small-scale hydro, wind turbine performance, and photovoltaic systems.

A82-15068 Incorporation and impact of a wind energy conversion system in generation expansion planning. K. F. Schenk and S. Chan (Ottawa, University, Ottawa, Canada). (Institute of Electrical and Electronics Engineers, Summer Meeting, Portland, OR, July 26-31, 1981.) IEEE Transactions on Power Apparatus and Systems, vol. PAS-100, Dec. 1981, p. 4710-4718 7 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada.

A computer model is used to simulate the operation of zero, 75 MW, and 150 MW wind energy conversion systems (WECS) in conjunction with other utility generating sources over a 20 year period. The wind turbines are modelled as multistate processes with an output proportional to wind variability. Cost analyses are reported for each year of simulated operation, and emphasis is placed on optimal generator expansion plans and capacity mix for displacement, fuel savings, and the impact of WECS on capital and operating costs. Attention is also given to the system loss of load probability (LOLP) and capacity reserve margin, along with cash flow and interest during construction, costs of alternatives to WECS (coal, nuclear, hydro, etc.) were also considered. Results include the total present worth of the 75 MW WECS was greater than that for the 150 MW WECS, the LOLP increases with the 75 MW system and decreases for the 150 MW WECS, and the 75 MW WECS replaces 16.7 GW of energy. The program is judged to be effective in predicting negative energy demand for utilities by use of WECS.

M.S.K.

A82-15589 Fuel and energy. J. H. Harker and J. R. Backhurst (Newcastle-upon-Tyne, University, Newcastle-upon-Tyne, England). London and New York, Academic Press, 1981. 373 p. 400 refs \$50.50.

Sources of energy for human use are reviewed, with consideration given to energy forms, conversion, efficiencies of conversion systems, identification of the sources and resources of energy, and the capabilities for various systems to meet enumerated estimates of energy demands. Primary fuels such as solids (coal), liquids (oil), and natural gas are examined for resource availability and methods of use. Processes to alter the form of primary fuels to form secondary fuels for specific applications are outlined, and methods of testing fuels for suitability are elaborated. Energy conversion with and without combustion is discussed for solar, wind, geothermal, nuclear, and chemical energy systems, and calculations of energy conversion efficiencies and economics are given, including energy conservation and recovery in industry.

M.S.K.

A82-15598 Fuel conservation measures in South African airways - A review of activity and a glimpse of future developments.

D. P. du Plooy Aeronautical Society of South Africa and South African Institute of Aeronautical Engineers, Journal, vol. 2, no. 1, 1981, p. 52-57.

Operational, structural, and design features intended as fuel conservation measures for wide-bodied aircraft are discussed. Lower speeds, maximum operational altitude flying, and balanced loading are procedures to save fuel, while maintenance of engine efficiency after rebuild, instrument accuracy, exterior cleanliness, and control surface operational accuracy reduce drag. Modification of the horizontal stabilizer is noted, and attention is given to work on the regenerative engine, advanced airfoils, winglets, and active controls, as well as laminar and natural flow control by using a tandem wing configuration. Suggestions for improvements to air traffic control systems are offered, while the increasing use of diesel fuels in automobile engines is seen as a destabilizing force in the price of jet fuels, and alternate fuels, such as synthetic crude and liquid hydrogen are reviewed.

A82-15665 An energy saving transit concept for new towns. J. E. Anderson (Minnesota, University, Minneapolis, MN). Journal of Advanced Transportation, vol. 15, Summer 1981, p 127-141, 7 refs.

Through study of the equation for energy use per trip it is shown how to choose the characteristics of a transit system in such a way that energy use is a minimum. It is shown that the resulting system also minimizes the general equation for cost per trip, takes very little of the urban land, emits virtually no noise, and, because it is electrically powered, does not directly pollute the air. A new town designed with such a system as the major mover of people and goods could have a much better balance between buildings and parks, the ground level would be pedestrian oriented and would provide an environment much more conducive to higher density living than present automobile-oriented towns, and many more trips could be taken by walking and cycling. The combination provides a highquality urban environment that would use substantially less energy then that required of auto-oriented towns today. Prospects for commercialization and research and development needs are discussed. (Author)

A82-16199 Dimethyl sulfate in particulate matter from coal- and oil-fired power plants. D. J. Eatough, M. L. Lee, D. W. Later, B. E. Richter, N. L. Eatough, and L. D. Hansen (Brigham Young University, Provo, UT). Environmental Science and Technology, vol. 15, Dec. 1981, p. 1502-1506. 9 refs. Research supported by the Electric Power Research Institute and American Cancer Society, Contract No. DE-AC02-80EV-10405.

A82-16272 † Effect of wick dryness on the performance of heat pipes with separate channels (Vluanie peresykhania fitulia na rabochie kharakteristiki teplovykh trub s razdel'nymi kanalami). Iu F. Gerasimov, Iu. E. Dolgirev, and Iu. F. Maidanik (Ural'skii Politekhnicheskii Institut, Sverdlovsk, USSR). *Energetika*, vol. 24, Oct. 1981, p. 68-74 In Russian.

A method which accounts for the effect of wick dryness is proposed for calculating the performance characteristics of heat pipes whose evaporation zone includes a system of longitudinal steam discharge pipes of rectangular cross section. By analyzing the vapor pressure drop in the wick, it is shown that as the wick grows dry, the heat pipe temperature increases. Calculations are found to be in good agreement with experimental results

A82-16:342 Model calculations of the chemical processes occurring in the plume of a coal-fired power plant. J. F. Meagher and M. Luria (Tennessee Valley Authority, Muscle Shoals, AL). Atmospheric Environment, vol. 16, no. 2, 1982, p. 183-195. 21 refs. Research supported by the U.S. Environmental Protection Agency and Tennessee Valley Authority.

Computer simulations of homogeneous gas phase chemical reactions which occur in the plume of a coal-fired power plant, were conducted to investigate the influence of various environmental parameters on the production of secondary pollutants. Under most conditions examined, hydroxyl radicals appeared to be the most important species in the homogeneous conversion of stack gases into secondary pollutants, and the conversion rates calculated for the oxidation of SO2 to SO4(2-) were consistent with those determined

experimentally. The concentration and relative properties of NO(x) from the power plant and reactive hydrocarbons from background air were found to determine the plume reactivity, and under typical summer conditions, the hydroxyl radical concentration reached a maximum at a HC/NO(x) ratio of about 20. The presence of ozone bulges under a wide variety of environmental and plant operational conditions was also predicted.

D.L.G.

A82-16348 Alternative transportation vehicles for military-base operations. D. A. Freiwald and W. J. Barattino (Los Alamos National Laboratory, Los Alamos, NM). International Journal of Hydrogen Energy, vol. 6, no. 6, 1981, p. 631-636.

It is noted that heretofore little attention has been given by the military services to developing alternatives to gasoline and dieselfueled ground-transportation vehicles because reliable alternative vehicle technology that could meet military performance requirements was not available. Descriptions are given of two promising types of propulsion systems for military-base vehicles hydrogenfueled internal combustion and fuel cell/electric hybrids (methanol or hydrogen fuel cells). It is thought that the military services could be a catalyst in reducing petroleum consumption within the U.S. transportation sector. The principal advantage of the military market is that on each base the organization already exists that is capable of generating and/or distributing an alternative fuel as well as maintaining the vehicle at properly scheduled intervals. C.R.

A82-17076 Energy and ceramics. Edited by P. Vincenzini (CNR, Istituto Statale d'Arte della Ceramica, Faenza, Italy) Amsterdam, Elsevier Scientific Publishing Co. (Materials Science Monographs, Volume 6), 1980, 1310 p. \$192

Consideration is given the improvement of energy use efficiency in such ceramic industry processes as the firing of bricks and tiles, through the use of ceramic fiber insulation, progressive kiln aggregates, new kiln furniture designs, new ceramic compositions and additives, and process optimization techniques. Such alternative energy sources as peat, and industrial by-product materials that include fly ash and waste glass are studied, and attention is given the application of silicon carbide, sialon, and silicon nitride to energy production and conversion systems such as adiabatic diesel engines and nuclear reactor components. Also covered are thermoelectric and piezoelectric materials, solar cells, and materials for MHD and other high-temperature applications.

A82-17281 Fuel conservation now. R. A Davis (Boeing Commercial Airplane Co., Renton, WA). In. Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 83-95.

Boeing is developing improvements for the existing production run of second generation transports, the 727 and 737 aircraft, in order to meet the escalation of jet transport fuel prices. The improvements include reduction in aircraft weight and aerodynamic drag, engine fuel efficiency, and aircraft operational improvements. Applications of a Kapton lightweight wire insulation was shown to save approximately 386 pounds for each 727 and 170 pounds for each 737. A 1% retrofit table Jrag reduction package is currently available for the 727. The JT8D 'A' series of engines for the -15 and -17 versions promise specific fuel consumption improvements of 5.5% to be available in 1982. The Performance Data Computer coupled with the full range Autothrottle/Speed Control will provide fuel savings up to 7% for the 727 and up to 6% for the 737.

A82-17282 Energy savings with today's technology. H. Dibley (British Airways, Heathrow, Middx., England). In: Safe and efficient management of energy, Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p. 97-133.

The crew of an aircraft seeks to maximize the energy available in the atmosphere and in the aircraft's fuel so as to ensure the efficient and safe operation of a flight. This is accomplished by displaying clear data in front of the crew, by providing the crew with comprehensive but readily useable information for fuel management (enabling minimum fuel reserves to be carried out), and by relieving

the crew of an unnecessary mental work load to use this information. The optimum profile for minimum fuel use involves (1) climbing with maximum thrust at an optimum speed to optimum cruise altitude for a given aircraft weight and wind gradient, (2) cruise climbing as weight decreases; (3) unrestricted descent to the destination field at optimum descent speed with the idle thrust; and (4) selection of a route which takes advantage of the wind structure to fly the minimum air miles. This can be accomplished by supplying the crew with meteorological information, the fuel flight plan, as well as knowledge of the fuel reserves. A minimum safe altitude display on the pilot's panel is also suggested.

Δ82-17289 Computer flight planning for fuel efficiency. L. M. Reinkens (Lockheed Aircraft Service Co., Ontario, CA). In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. ton, VA, Flight Safety Foundation, Inc., 1980, p. 258-269.

The need to improve fuel efficiency is forcing the aviation industry to reassess the use of computer flight planning (CFP). In the past decade, CFP was based on mechanizing manual techniques; the demand now is for CFP to take technology one step further into (1) inexpensive on-line conversational systems available throughout the world; (2) refined optimization techniques in route and profile selection to minimize fuel uplift, maximize payload, and extend range; (3) reanalysis enroute to reflect take-off variations and minimize fuel consumption; (4) reanalysis in the event of diversion to an alternate, (5) remote data base entry; and (6) refined reserve fuel consumption. The proposed interactive system and conversational network are given, differences in cruise speeds, fuel, and payload requirements of the Boeing 737 and 747 are illustrated. J.F.

A82-17420 The all-electric airplane - A new trend, M. J. Cronin (Lockheed-California Co., Burbank, CA). Lockheed Horizons, Winter 1981-1982, p. 28-39.

After a brief, historical consideration of the progress of aeronautics and of the feasibility of electrical-propulsion aircraft such as the photovoltaic Solar Challenger, a description is given of the direct operating cost reductions and system efficiencies derived from the replacement of bleed air/hydraulic/pneumatic/electrical aircraft power systems by a single, electric power system. In such a system, electric generators are the sole source of power for such functions as (1) the primary/secondary flight control system; (2) de-icing and anti-icing, (3) environmental controls, (4) electronics and avionics loads; and (5) landing gear actuation and other mechanical functions. Estimates are presented of cycled weight savings and of the power extraction penalties that may be obviated by the all-electric system. The integration of power-by-wire and fly-by-wire systems is also discussed. O.C.

Energy for the year 2000. Edited by R. Wilson (Harvard University, Cambridge, MA). New York, Plenum Press (Ettore Majorana International Science Series: Physical Sciences. Volume 6), 1980, 408 p. \$42.50.

Possible energy mixes for the U.S. in the 1979-2000 AD time frame are considered. The manufacturing and operational characteristics of photovoltaics are discussed, as are other solar options, such as flat plate collectors, biomass energy production, wind energy conversion systems, and OTEC plants. Attention was given to wave energy conversion and to the role of utilities in the diversification of energy sources. United States energy policy is explored, and various energy scenarios are compared. Breeder reactor technology is detailed, along with reactor safety and the quantitative assessment of risk for reactor safety. Finally, coal conversion is examined, including gasification and fluidized bed technologies.

Macro-engineering: The rich potential: Proceedings of the Third Symposium, San Francisco, CA, January 6, 1980. Symposium sponsored by the American Association for the Advancement of Science and American Institute of Aeronautics and Astronautics. Edited by R. Salkeld (System Development Corp., Santa Monica, CA), F. P. Davidson, and C. L. Meador (MIT, Cambridge, MA). New York, American Institute of Aeronautics and Astronautics, 1981. 186 p. Members, \$19.; nonmembers, \$24.

After considering the relationship of large-scale enterprises to social attitudes and social change; attention is given to: (1) increasing the degree of communication between project-managers and clients in developing countries, (2) the creation of a public-service data utility, and (3) the development of the Great Recycling and Northern Development (GRAND) canal concept for water management on the North American continent. Also discussed are: (4) a solar thermal aerostat research station consisting of a large-diameter, solar-heated sphere capable of stratospheric stationkeeping, (5) a macroengineering solution to the macroproblem posed by the application of solar power satellites to the energy needs of India, (6) a multipurpose microwave space facility for the 1990s, and (7) the disposal of nuclear wastes in space.

N82-10254# KVB, Inc., Irvine, Calif.

BASELINE DATA ON UTILIZATION OF LOW-GRADE FUELS IN GAS TURBINE APPLICATIONS. VOLUME 3: EMIS-**SIONS EVALUATION Final Report**

T Sonnichsen Jun 1981 108 p refs Sponsored in part by Electric Power Research Inst (EPRI Proj 1079-3)

EPRI-AP-1882-Vol-3) (DE81-903764,

Avad NTIS

HC A06/MF A01

A series of field tests was conducted on two residual-oil-fired gas turbine/heat recovery steam generators (HRSG) comprising a Westinghouse PACE 260-MW combined-cycle unit Base load emission levels were determined. A series of tests was also made at reduced operating loads. Emission measurements included (1) gaseous constituents measured by continuous monitoring instrumentation (O2, CO2, NO, NO sub x, and SO2) and by wet chemistry methods (SO3, aldehydes, and chlorides). and (2) particulate characteristics (mass loding, smoke spot number, submicron particle size, and particle morphology) Corrected NO sub x emissions at base load were 170 ppM and 200 ppM with and without HRSG afterburners in service, respectively. The NO sub x emissions decreased with water injection by 50% and were unchanged with the turbine wash The NO sub x increased with load DOF

N82-10277# Minnesota Univ , St Paul Underground Space

EARTH SHELTER 2 1979-1980 USC SERIES

1980 236 p refs Presented at the Earth Sheltered Housing Conf. and Exhibition, Minneapolis, 9-11 Apr. 1980, sponsored by the Underground Space Center of the Minnesota Univ and the Am Underground Space Association, and Minnesota Soc Am Inst of Architects, and Minnesota Soc of Professional Eng Sponsored by DOE

(CONF-800438) Avail NTIS HC A11/MF A01

Abstracts are presented of 22 conference papers which discuss criteria for constructing earth-sheltered structures for residential and commercial purposes. Aesthetics and the manipulation of form, space, and natural light are examined as well as ionizing radiation levels, legal liabilities in design, construction, and ownership, and the impact of restrictive covenants. The locations and energy conservation efficiency of 80 earth-covered structures in Oklahoma are also examined

ARH

N82-10334# Massachusetts Inst of Tech, Cambridge

INTEGRATION OF DECENTRALIZED GENERATORS WITH THE ELECTRIC POWER GRID

Susan Finger Apr 1981 193 p refs (Contract DE-AMO1-76EI-02295) MIT-EL-81-011)

Avail NTIS

(DE81-029731. HC A09/MF A01

The economic interactions of customer-owned electrical generators with the central electric power grid was studied. The reciprocal effects of the operation and expansion plans of the utility, and the resulting price of electricity, and the demand patterns and expansion plans of customers are discussed. The system is modeled in an open-loop feedback mode that allows both the utility and the customers to update their plans and expectations for the next time period based on the other's actions in the current time period and based on any new information such as the current time period and based on any new information such as the current price of oil. The utility and the customers solve similar operation and expansion problems, except that each has control over different variables

N82-10506*# DHR Inc., Washington, D.C. MARKET ASSESSMENT OF PHOTOVOLTAIC POWER SYSTEMS FOR AGRICULTURAL APPLICATIONS IN MEXICO

William Steigelmann and Itil Asmon, (ARD, Inc.) Jul 1981 135 n refs

(Contracts DEN3-180, DE-AI01-79ET-20485)

(NASA-CR-165441, DOE/NASA/0180-3) NTIS HC A07/MF A01 CSCL 10A

The first year of cost-competitiveness, the market potential. and the environment in which PV systems would be marketed and employed were examined Market elements specific to Mexico addressed include (1) useful applications and estimates of the potential market for PV systems. (2) power requirements and load profiles for applications compatible with PV usage, (3) operating and cost characteristics of power systems that compete against PV. (4) national development goals in rural electrification and rural services, technology programs and government policies that influence the demand for PV in Mexico. (5) financing mechanisms and capital available for PV acquisition. (6) channels for distribution, installation and maintenance of PV systems, and (7) appropriate methods for conducting business

N82-10514# Massachusetts Inst of Tech, Cambridge OESYS: A SIMULATION TOOL FOR NONCONVENTIONAL ENERGY APPLICATIONS ANALYSIS. THEORETICAL AND OPERATIONAL DESCRIPTION WITH USER DOCUMENTA-TION

Thomas L Dinwoodie Aug 1980 190 p refs (Contract DE-AMO1-76EI-02295) (DE81-029701, MIT-EL-80-022) NTIS

HC A09/MF A01 A method is developed for assessing both the operational and economic performance of variable mixes of energy conversion technologies within their specific service environments. This method is incorporated into OESYS (Optional Energy Systems Simulator), a computer model with the specific capability to assess conditions of economic viability and service reliability for energy project evaluation. The OESYS program is especially well suited to handle stochastic (weather dependent) generation technologies, and simultaneously handles the generation, transfer, and demand of multiple energy quality levels (electricity, high/low grade thermal, liquid/gaseous fuels, etc.) The model can be applied to most use sectors, including residential, commercial, industrial, and institutional, or combinations of use sectors. A model summary description is given. A theoretical description of the types of energy applications handled by OESYS, an operational description of the model, user documentation, and three sample studies are included

N82-10517# Atlanta Univ. Ga Dept of Chemistry COOPERATIVE PROGRAM OF APPLIED ENERGY RE-Report, 1 Oct. 1979 - 31 Dec. 1980

1980

140 p refs Prepared in cooperation with Georgia Inst

of Technology, Atlanta (Contract DE-FG05-79ET-60058)

(DE81-028916, DOE/ET-60058/T1) Avail NTIS HC A07/MF A01

Studies conducted by groups at Atlanta University and the Georgia Institute of Technology Engineering Experiment Station are described. These efforts were proposed as exploratory studies in the area of alternative energy technologies as preliminary work leading to a multi-year program of specific developmental efforts Topics chosen were supportive of on-going research programs at the two institutions. Work proposed included pertinent literature search, computer modeling, initial choices of systems, and preliminary parametric studies DOE

N82-10544# Midwest Research Inst., Golden, Colo. Solar **Energy Research Inst**

ENERGY END-USE REQUIREMENTS IN MANUFACTURING, **VOLUME 3**

F Krawiec, Dilip R Limaye (Synergic Resources Corp.), Steve Isser (Synergic Resources Corp), Roy Beatty (Synergic Resources Corp), Glenn Colville (Synergic Resources Corp), and Karen Lang (Synergic Resources Corp.) Jul 1981 624 p (Contracts DE-AC02-77CH-00178, EG-77-C-01-4042)

(DE81-027976, SERI/TR-733-790R-Vol-3) Avail. NTIS HC A99/MF A01

Data on the US and state manufacturing subsectors' energy end use requirements disaggregated by 2 and 4 digit SIC and temperature level in 1990 are presented

N82-10551# Science Applications, Inc., La Jolla, Calif PROGRAMMER'S MANUAL FOR THE DOEHPE (DOE HEAT PUMP EFFICIENCY) PROGRAM

23 Oct 1980 76 p refs (Contract DE-AC03-79CS-10757)

(DE81-769452, SAI-444-80-533-W) Avail NTIS HC A05/MF A01

The computer code DOEHPE, which is used to calculate air source heat pump seasonal and annual performance factors and energy consumption is described. The program computes heating season performance factors, seasonal energy efficiency ratios. representative regional annual performance factors, representative regional annual energy consumption and national energy consumption from the standard measurements of heat pump capacity and power input and heat pump descriptive information as input data. The calculation for single and dual speed compressor heat pumps and single speed compressor heating only heat pumps are described Representative regional performance factors are computed for each of six major climatic regions shown for the US, and for each of the standard design heating requirements

N82-10552# Oak Ridge National Lab , Tenn Energy Div ANNUAL CYCLE ENERGY SYSTEM

Robert E Minturn 1981 6 p refs Presented at the Heat Pump Contractors' Program Integration Meeting, Washington, D C, 2-4 Jun 1981

(Contract W-7405-eng-26)

CONF-810672-16) NTIS (DE81-024911, Avail

HC A02/MF A01

The annual cycle energy system (ACES) program which incorporates in a practical system the outstanding energy conservation potential that exists when the unidirectional heat pump and the interseasonal storage of energy are combined to provide heating, cooling, and domestic hot water to buildings is described Information on the system, its applicability to different geographic areas, and the methodology for designing and building systems are enumerated It is shown that the system is rugged, reliable, and appreciably more conservative of purchased energy than all practical alternatives. An ACES residential design methodology was also developed it is concluded that the system is constant in efficiency and capacity during winter operation. independent of extremes in weather, contributes to the reduction of peak demand and increases in daily and seasonal load

N82-10561# Oak Ridge National Lab , Tenn WATER-RELATED CONSTRAINTS TO THE DEVELOPMENT OF GEOTHERMAL ELECTRIC GENERATING STATIONS

NTIS

NTIS

Avail

R C Robertson, Alf D Shepherd, Carey S Rosemarin, and Michael W Mayfield Jun 1981 160 n refs

(Contract W-7405-eng-26)

(DE81-025138, **ÖRNL/TM-7718**) Avail

HC A08/MF A01

The water related constraints concerning geothermal energy are discussed. Three different constraints are (1) water requirements of geothermal power stations, (2) resource characteristics of the most promising hydrothermal areas and regional and local water supply situations, and (3) legal issues confronting potential users of water at geothermal power plants in the states in which the resource areas are located. A total of 25 geothermal resource areas were studied It is found that each had a hydrothermal resource temperature in excess of 150 C and an estimated 30 year potential of greater than 100-MW(e) capacity DOF

N82-10562# Montana Dept of Natural Resources and Conservation, Helena

MONTANA GEOTHERMAL HANDBOOK: A GUIDE TO AGENCIES, REGULATIONS, PERMITS AND FINANCIAL AIDS FOR GEOTHERMAL DEVELOPMENT

Steven Perlmutter and Jeff Birkby 1980 52 p

(Contract DE-FC07-79ID-12014)

(DE81-024315, DOE/ID-12014/T1)

HC A04/MF A01

The handbook is divided into three parts a list of the permits required for various thermal projects, and an estimate of time

needed to obtain them, a brief discussion of the statutes and regulations referred to; and a description of the state and federal grant and loan funding available to a prospective geothermal developer

N82-10572# KA-Planungs G m b H , Heidelberg (West Germany) PRELIMINARY INVESTIGATION ON A PRIMARY ENERGY SAVING HEAT SUPPLY SYSTEM FOR THE RESIDENTIAL DISTRICT 'MARIA LINDENHOF' IN DORSTEN, WEST **GERMANY Final Report**

Alfred Bechtel, Klaus Berlinghoff, Hans Grossmann, Helmut Kaschube, and Friedrich Reinmuth Bonn Bundesministerium fuer Forschung und Technologie Dec 1980 126 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-80-157, ISSN-0340-7608) Avail NTIS HC A06/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 26,50

Ways and means to operate a heating station by gas motor-driven heat pumps, using river water as heat source are investigated. The economic viability of the scheme is considered A comparison with conventional technologies clearly shows the feasibility and effectiveness of this application, and at the same time supplies guidelines for design and dimensioning. Because of possible energy saving, the present investigation supports the realization of the project Author (ESA)

N82-10573# Renault Vehicles Industriels (France) des Etudes et Recherches

ENERGY CONSUMPTION AND HEAVY-DUTY VEHICLES CONSOMMATION D'ENERGIE ET LES POIDS LOURDS)

Yves Bonnetain 1980 18 p In FRENCH Presented at STA Journees Poids Lourds, Paris, 8-9 Oct 1980 Avail NTIS HC A02/MF A01

Research and analysis which leads to energy conservation in the operation of tractor-trailers (semis) was reviewed. Two approaches are emphasized design improvements on the vehicle itself, and policies or dashboard instrumentation which result in a more efficient use of the vehicle. Evidence is presented to show that immediate and significant reductions in fuel consumption are possible merely by instigating more efficient driving practices, e.g., speed laws, governors on engines, etc

Author (ESA)

N82-10583 Texas Univ at Dallas

OIL AND GAS INDUSTRY AND ENVIRONMENTAL POLLUTION: APPLICATION OF SYSTEMS RELIABILITY ANALYSIS FOR THE EVALUATION OF THE STATUS OF ENVIRONMENTAL POLLUTION CONTROL IN THE NIGER-IAN PETROLEUM INDUSTRY Ph.D. Thesis

Azhinoto Ozodio Ikpah 1981 377 p Avail Univ Microfilms Order No 8118224

Current environmental pollution control policies, regulations, oil field management practices and programs for detection, inventory, prevention and control of oil spills/pollution in Nigeria were examined The status of pollution control in the Nigerian petroleum industry was evaluated Spill event data which were analyzed based on shore, category systems, cause/effect relationip, clean-up method, violation and other parameters pertinent to pollution control in the oil industry. Spill data indicated that frequency of spill events is high, dispersant is indiscriminately used, more spills occur onshore, water disposal method is poor, and equipment failure, operators' maintenance error and third party account for a large number of spills. Pipes, valves and gaskets are spill vulnerable components, and the product spilled is generally crude oil. Few spill events were considered violations of federal laws Standard engineering designs and criteria are employed in production of oil in Nigeria, but the level of investments on strictly pollution control equipments and personnel is minimal. It is concluded that legal and institutional arrangement for pollution control in the Nigerian petroleum industry need modification and updating Dissert Abstr

N82-10585# Oak Ridge National Lab , Tenn Fossil Energy Information Center ENVIRONMENTAL COMPLIANCE PROGRAM HANDBOOK Aug 1981 332 p (Contract W-7405-eng-26) (DE81-030226. ORNL/EIS-171) Avail NTIS HC A15/MF A01

Only by demonstrating that energy technologies can be built and operated without adverse environmental impact can these technologies be considered as proven and ready for commercialization by the private sector. This handbook is one of a series covering federal laws and regulations and the laws and regulations of selected states that pertain to air quality, water quality, and the identification and disposal of solid and hazardous wastes The data summary sheets are part of a computer file Thi, handbook identifies and provides abstracts to those pertinent laws and regulations which were in force in the State of Ohio in early 1980. The permit forms are those in use during that time frame

N82-10586# Michigan Univ. Ann Arbor Dept of Aerospace Engineering

STUDY OF THE FORMATION OF SUBMICRON PARTICU-LATES GENERATED BY COAL COMBUSTION Quarterly Progress Report, 1 Apr. - 30 Jun 1981

P M Sherman and D R Glass Jul 1981 28 p refs

(Contract DE-FG22-80PC-30305)

(DE81-027447, DOE/PC-30305/T3, QPR-3) Avail NTIS HC A03/MF A01

The formation of the very small particles was investigated so that combustion and heat transfer conditions which will prevent their formulation can be identified Emphasis was largely on perfecting techniques for obtaining electron microscope data which can be correlated with variations in heat transfer and combustion parameters. Improvements include better sealing of the furnace tube provision for measurement of the entire flow field downstream of the flame, better control of the exhaust stream, better control of the coal dust feeder, and better control of the temperature of the secondary air Program focus on particles in the 50 A to 0.1 micron range. These were largely overlooked in the past because they are difficult to detect

N82-10590# Argonne National Lab , III STUDIES OF THE REGENERATION OF ACTIVATED BAUXITE USED AS GRANULAR SORBENT FOR THE CONTROL OF ALKALI VAPORS FROM HOT FLUE GAS OF COAL COMBUSTION

S H D Lee, S D Smith, W M Swift, and Irving Johnson May 1981 51 p refs (Contract W-31-109-eng-38)

(DE81-030192. ANL/CEN/FE-81-1) NTIS HC A04/MF A01

Regeneration of activated bauxite by water leaching and thermal swing method was studied It was found that granular activated bauxite was very effective when used as a filter medium in granular bed filters to remove gaseous alkali metal compounds from simulated hot flue gas of PFBC Activated bauxite that captured alkalı chloride vapors easily and effectively regenerated for reuse by a simple water leaching method. Data were obtained on (1) the leaching rate of the absorbed NaCl (2) effects on the leaching rate of absorbed NaCl loading, leaching temperature, and the amount of water, and (3) water retention in activated bauxite after leaching. Physical changes and particle attrition of activated bauxite resulting from regeneration are discussed The sorption mechanisms of activated bauxite toward alkali chloride vapors are interpreted

N82-10591# Edgerton, Germeshausen and Grier, Inc., Idaho Falls, Idaho

INEL GOETHERMAL ENVIRONMENTAL PROGRAM Annual Report, 1980

L S Cahn, T L. Thurow, and J A Martinez Apr 1981 73 p refs

(Contract DE-AC07-76ID-01570)

(DE81-025671, EGG-2113) Avail NTIS HC A04/MF A01 An overview of continuing environmental research and monitoring programs conducted at the Raft River Geothermal Site is provided. The monitoring programs are designed to collect data on the physical, biological and human environments of the development area Primary research during 1980 emphasized completing baseline studies on terrestrial fauna. establishing an air quality monitoring network, investigating potential sources of fluoride in the Raft River valley, and studying water level changes in the shallow monitor wells in response to development of the geothermal resource. DOE

N82-10592# Colorado State Univ., Fort Collins Dept of Atmospheric Science

EFFECTS OF ATMOSPHERIC VARIABILITY ON ENERGY UTILIZATION AND CONSERVATION Progress Report, 1 Jan. - 30 Jun. 1981

Elmar R Reiter, C C Burns, H Cochrane, G R Johnson, H Leong, and J D Sheaffer Jul 1981 99 p refs (Contract DE-AS02-76EV-01340)

(DF81-026308 DOE/EV-01340/1) NTIS HC A05/MF A01

The research was focused on four major tasks planetary wave variability and climate fluctuations, regional energy demand modelling, energy demand modelling for air conditioning, and economic factors in climate-sensitive space-conditioning systems design. Efforts in each of these areas are outlined and described in detail. Predicting the impact of climate variability on energy utilization involves understanding both the mechanisms underlying atmospheric variability and the response of energy demand systems to atmospheric variations. Summary descriptions of significant progress in both areas are presented

N82-10594# Hart (Fred C) Associates, Inc., New York, NY METHODOLOGY FOR DETERMINING THE IMPACT OF ENVIRONMENTAL REGULATORY PROGRAMS Final Report

B T Delaney, D D Roderique, and T S Sekulic May 1981 165 p refs Sponsored by Electric Power Research Inst (DE81-903429, EPRI-CS-1834, TPS-79-743) Avail NTIS HC A08/MF A01

Major federal environmental legislation and regulatory programs affecting the management of air, water, land and solid waste were reviewed. Existing and future environmental regulatory programs and their potential impact on the development and commercialization of advanced, coal-based energy conversion systems are examined it is determined that the analysis and interpretation of technical information and data collected can be directed towards the development of a methodology by which environmental impacts are systematically reviewed and problem

N82-10598# Argonne National Lab. III
ECONOMIC AND ENVIRONMENTAL TRADEOFFS IN COAL CONVERSION

C D Livengood, H S Huang, and P S Farber 1980 20 p refs Presented at the Ann Meeting of the Air Pollution Control Assoc , Montreal, 22-27 Jun 1980 (Contract W-31-109-eng-38)

(CONF-800608-8) Avail NTIS HC A02/MF A01

The costs of environmental control systems and the difficulties of solid waste disposal are discussed. Unless significant cost breakthroughs are achieved, SRC-1 does not appear economically competitive for new large power plants. The use of SRC is favored in plants converting from oil. The recent increased interest in reducing emissions from existing coal fired plants as a control measure for acid rain could open up a significant new market for highly processed coal such as SRC-1

N82-10599# ECP, Inc., El Segundo, Calif CRYSTALLIZED FLY-ASH FEASIBILITY STUDY Final

May 1981 78 p refs Sponsored in part by Electric Power Research Inst

(EPRI Proj 1210-1)

(EPRI-EL-1836) Avail NTIS HC A05/MF A01

A study to determine the feasibility for production and use of crystallized fly ash is presented. The raw materials (fly ash, fluxing, nucleating and crystallizing agents), molten state and crystallization analysis and characterization of crystallized fly ash are discussed in detail. The development of the process along with the structural and insulation characteristics of the crystallized fly ash as a mechanical support element for electrical conductors are also described in detail DOE

N82-10601# Harvard Univ., Cambridge, Mass School of

RELAXING ENVIRONMENTAL STANDARDS DURING OIL-SUPPLY DISRUPTIONS. PAST, PRESENT AND **FUTURE M.A. Thesis**

Thomas Hansen Birdsall 13 Apr 1981 132 p refs (Contract DE-AC01-80PE-70278)

(DE81-024250, DOE/PE-70278/T15) NTIS Avail HC A01/MF A01

Relaxation of environmental standards during oil supply

disruptions were examined. The following two policy questions are addressed (1) should environmental standards such as sulfur emissions limitations be relaxed during oil supply disruptions. and (2) if relaxing a particular standard appears desirable, when, where and how should it be relaxed. It is argued that disruptions could suddenly result in marginal pollution abatement costs much greater than the benefits from, or demand for, the marginal improvement in air quality from such abatement, justifying temporary variances. A set of criteria for evaluating variance policies are developed on the basis of both the theoretical rationale for variances and institutional or implementation considerations. Present federal variance policy are described and the criteria are used to evaluate current policy

N82-10605# Harvard Univ, Cambridge, Mass School of Government

CASE STUDIES IN THE APPLICATION OF AIR QUALITY MODELLING IN ENVIRONMENTAL DECISION MAKING: SUMMARY AND RECOMMENDATIONS

Catherine G Miller May 1981 92 p refs (Grant EPA-R-805558-01)

EPA-600/4-01-034) NTIS (PB81-213233. Avail

HC A05/MF A01 CSCL 13B

The application of air quality models to examine the problems encountered when trying to use these models in makin environmental policy decisions was undertaken. It is shown that technical and political constraints exist but that unresolved policy issues, the management of the decision process and conflicting institutional and organizational interests also cause problems Reommendations are made on how to improve the technical planning and management of the decision process so that the air quality models can become a better policy tool within the state of the art, political and organizational constraints

N82-10608# Geological Survey, Champaign, III
COAL FLY ASH: A REVIEW OF THE LITERATURE AND PROPOSED CLASSIFICATION SYSTEM WITH EMPHASIS ON ENVIRONMENTAL IMPACTS

William R Roy, Richard G Thiery (Illinois State Natural History Survey), Rudolph M Schuller, and John J Suloway (Illinois State Natural History Survey) Apr 1981 75 p refs (PB81-215014, IL/SGS/EGN-96)

HC A04/MF A01 CSCL 13B

The scientific literature on fly ash generated by coal burning power plants cites is reported. General conclusions are formulated, on the basis of data compiled from this review, on the physiochemical characteristics of the solid waste and the possible environmental impacts of its disposal

N82-10717# Department of Agriculture, Washington, D.C. National Economics Div

ENERGY EXPENDITURE AND DIETARY CHANGE

Larry G Traub and Thomas A Stucker May 1981 27 p AGESS-810512) (PB81-218471 HC A03/MF A01 CSCL 10A

Comparative expenditures for food and costs of energy in the food system under alternative diets was studied. The types of diet analyzed are the current average diet consumed, and a diet consistent with specifications of the dietary guidelines. It is shown that the greatest savings under a diet altered to conform with the dietary guidelines is in electrical generation, and the least energy savings in refined petroleum use GRA

N82-11175# Coordinating Research Council, Inc., Atlanta, Ga INFORMATIONAL REPORT ON THE MEASUREMENT AND CHARACTERIZATION OF DIESEL EXHAUST EMISSIONS J M Perez, F J Hills, D Schuetzle, and R L Williams Dec

1980 286 p refs (PB81-221251 CRC-APRAC-CAPI-1-64-517) Avail NTIS HC A13/MF A01 CSCL 07D

Guidance on selection of methods for collection and analysis of the constituents in diesel exhaust to enable a complete chemical characterization of the exhaust is provided. A thorough review of the state of the art for measuring diesel emissions was prepared Methods were compiled and their engineering applicability was evaluated Available methods were reviewed to establish the state of the art. In some cases, sufficient documentation for the use of the method was available in the literature. In other cases, cooperative round-robin testing of the method was conducted

and these findings are reported. The methods allow complete assessment of the constituents that are of current interest in

N82-11233# Bechtel Corp., San Francisco, Calif.

ALTERNATIVE FUEL FOR THE STEEL INDUSTRY OF NORTHERN INDIANA: A PREFEASIBILITY STUDY OF A CENTRAL COAL GASIFICATION PROJECT

May 1981 275 p refs Sponsored in part by Northern Indiana Public Service Co

(Contract DE-FG01-80RA-50146)

(DE81-029314, DOE/RA-50146/1)

HC A12/MF A01 A survey of the demand for natural gas indicates a wide variation, from a low of 220 billion Btu per day to a high of 387 billion Btu per day After an examination of the market demand, it was concluded that the synthetic fuels plant should be sized to produce 120 billion Btu per day of gas. Due to the costs of installing additional gas distribution systems and modifying fuel burning equipment, it was concluded that a medium Btu gas should be produced that would have special properties to meet the requirements of existing equipment. The Lurgi and Texaco gasification processes were chosen as the basis for the study The most significant environmental constraint will be air quality Although the use of either process is feasible, NIPSCO selected the Texaco case for the development of the economics A cash flow analysis indicates that the price of medium Btu gas required to yield a 15 percent DCF return on equity is \$5.67 per million Btu in 1981 dollars This is approximately equal to the current price of imported oil it is based on a 20 year financial analysis using a 3-1 debt to equity ratio and assumes an annual escalation in cost and gas price of 10 percent DOE

N82-11239# TRW, Inc., Redondo Beach, Calif. LABORATORY STUDY FOR REMOVAL OF ORGANIC SULFUR FROM COAL Final Report

1 Jul 1981 210 p refs (Contract DE-AC22-80PC-30141) (DE81-025132. DOE/PC-30141/T4)

NTIS

HC A10/MF A01

A description of laboratory experimental equipment and a detailed discussion of the results is presented Initial and concluding engineering design and cost estimations are also presented and the last two sections contain recommendations for future work and an appendix of laboratory data. The TRW Gravimelt Process involves the treatment of mine-cleaned coal with molten potassium and or sodium hydroxide to chemically extract both organic and pyritic sulfur into the molten alkali The coal mineral content is broken down to forms insoluble in water but soluble in a second liquid, usually dilute sulfuric acid The high density of the melt causes the desulfurized coal to float to the surface, where it is skimmed off. The coal is then washed with water to completely recover the alkali metal and the coal is dried If the coal is next washed with a second liquid, almost all of the mineral matter is extracted into the solution

N82-11245# Aerospace Corp., Los Angeles, Calif
NEAR-TERM GOALS FOR ALCOHOL FUELS FROM BIO-MASS. AN OVERVIEW OF RESOURCE REQUIREMENTS, LAND USE, ENVIRONMENTAL, AND SOCIOECONOMIC IMPACTS

J Halsey, D Hazard, K Kawaoka, K Stephens, and G DAlessio (DOE) Argonne, III Argonne Natl Lab Dec 1980 111 p

(Contract W-31-109-eng-38) (DE81-029987.

ANL/EES-TM-149)

HC A06/MF A01

Avail

The biomass resources needed to meet national alcohol production goals are examined, available technologies for utilizing agricultural products and byproducts are reviewed, and potential environmental and socioeconomic impacts of near-term alcohol production are identified. Near-term (1985 to 1986) land resource requirements and impacts are emphasized with particular attention to the major corn producing states. Results indicate that (1) the grain availability for ethanol production does not appear to be limiting for these near-term production capacity goals; (2) major expansion of acreage planted in corn should not result from these goals, (3) environmental impacts on and from farm lands should not increase significantly. (4) food prices may increase

due to the near-term goals, but farmers should benefit overall, and (5) the expansion of alcohol production in the longer term (1986 to 2000 and beyond) will necessitate the use of additional biomass feedstocks and residues

N82-11249# International Science and Technology Inst , Inc , Washington, D. C.

ASSESSMENT OF OIL-SHALE TECHNOLOGY IN BRAZIL Final Technical Report, 27 Oct. 1980 - 27 Jul. 1981 27 Jul 1981 143 p refs (Contract DE-AC01-80ER-30010)

(DE81-027574. DOE/ER-30010/1)

HC A07/MF A01

NTIS Avail

NTIS

This assessment investigates whether US oil shale developers might benefit from the experience gained by the Brazilians in the operation of their Usina Prototipo do Irati oil shale demonstration plant at Sao Mateus do Sul, and from the data generated from their oil shale research and development programs. A chapter providing background information on Brazil and the Brazilian oil shale deposits is followed by an examination of the potential recovery processes applicable to Brazilian oil shale. The evolution of the Brazilian retorting system is reviewed and compared with the mining and retorting proposed for US shales Factors impacting on the economics of shale oil production in Brazil are reviewed and compared to economic analyses of oil shale production in the US Chapters examining the consequences of shale development in terms of impact on the physical environment and the oil shale worker complete the report

N82-11252# Department of Energy, Oak Ridge, Tenn SOLVENT-REFINED COAL-1 DEMONSTRATION PROJECT. STATEMENT. FINAL ENVIRONMENTAL IMPACT

VOLUME 1 OF 2 Final Report Jul 1981 700 p refs

(DE81-025983, DOE/EIS-0073-Vol-1) Avail

HC A99/MF A01

The potential environmental impacts associated with the construction and operation of a 6000-tpsd-capacity coal liquefaction facility at Newman, Kentucky which will demonstrate the technical operability, economic viability, and environmental acceptability of an SRC-I process are assessed Impacts assessed include the following effects of the project on occupational and public health resulting from the production and use of SRC products, potential impacts on terrestrial and aquatic ecology. potential and expected impacts on land use, withdrawal and alteration of prime agricultural land, projected effects on flood-plain and wetland areas, potential impacts on surface water and groundwater, potential impacts on ambient air quality, potential change of the cultural landscape, potential impacts on sites of archaeological significance, and changes to existing economic and social characteristics of the site area. Long-range and cumulative impacts of a future commercial expansion of the proposed facility at the proposed site to an approximately 30,000-tpsd capacity are also addressed A construction and

N82-11263# California Univ , Livermore Lawrence Livermore Lab

operational monitoring plan to assess the effectiveness of the

planned mitigatory measures for the duration of the demonstration

POSSIBLE USE OF COAL IN HAWAII, 1980 - 2000 R B Bell 12 Feb 1981 52 p refs (Contract W-7405-eng-48)

phase is presented

(DE81-028266, UCRL-53121) Avail NTIS HC A04/MF A01

The possibilities for the use of coal in the State of Hawaii are explored. The nature of the Hawaiian energy sector the possible role coal could play in that sector, and some of the costs and consequences of introducing coal into the State are addressed. The technical issues connected with coal use are DOE presented

N82-11265# Edgerton, Germeshausen and Grier, Inc., Idaho Falls Idaho

ALCOHOL FUELS IN THE UNITED STATES

R R Stiger 1981 12 p refs Presented at tht Am Nucl Soc. Ann. Meeting, Miami Beach, Fla , 7 Jun 1981

(Contract DE-ACO7-76ID-01570)

(DE81-026013. CONF-810606-75) NTIS

An overview of the social and technical issues surrounding the production of alcohol for fuels is presented. A brief analysis of the United States Alcohol Program is followed by a discussion of technical and economic factors that affect the production of alcohol fuels

N82-11270# Water Resources Council, Washington, D C COAL LIQUEFACTION DEMONSTRATION PLANT NEAR MORGANTOWN, WEST VIRGINIA: WATER ASSESSMENT **REPORT Summary Report**

21 Aug 1980 14 p refs Prepared in cooperation with Ohio

River Basin Commission

(PB81-216103) Avail NTIS HC A02/MF A01 CSCL 08H A preliminary assessment of the commercial project as currently planned is presented. Topics covered include the need for water management policies for the Ohio River Basin to regulate water distribution, as well as a pollution monitoring system

NTIS

N82-11273# Research Triangle Inst., Research Triangle Park,

COAL GASIFIER PARAMETERS INFLUENCING ENVIRON-MENTAL POLLUTANT PRODUCTION

D A Green, J G Cleland, D P Daugherty, W J McMichael, F O Mixon, and R S Truesdale Jun 1981 95 p refs (Grant EPA-R-804979)

(PB81-221301, RTI/1934/00-03F, EPA-600/7-81-098) Avail NTIS HC A05/MF A01 CSCL 21D

A series of fixed-bed coal gasification and pyrolysis tests were performed in a laboratory scale reactor of 6.6 cm inside diameter. Chemical analyses were conducted on the product gas, the aqueous condensate, the tar, and the solid residue from the tests. The effects of process variables, such as feed mode, catalytic treatment, pressure, mesh size, and coal type, upon byproduct and pollutant yields are described. The production of gaseous sulfur compounds, benezene and derivatives (BTX), phenolics (phenol, cresols, and xylenols), and tar were measured, and the fate of trace elements such as arsenic, selenium, and lead were determined Byproduct production associated with the pyrolysis phase of gasification was investigated with emphasis on the effects of particle size, residence time, and atmosphere. Continuous operation was found to result in greatly reduced tar and phenolic production

N82-11274# TRW, Inc., McLean, Va **Energy Systems** Group

ENVIRONMENTAL RESEARCH PLAN FOR GAS SUPPLY TECHNOLOGIES VOLUME 2: ENVIRONMENTAL RE-SEARCH PLAN Final Report

L M Tipton 29 May 1981 168 p refs 2 Vol

(Contract GR1-5080-351-0316) (PB81-222317. GRI-80/0013 2)

HC A08/MF A01 CSCL 21D

Federal environmental regulations affecting gas supply technologies are reviewed. The technological and environmental state of the art of each gas supply technology was analyzed with the help of a series of experts, in gas supply technology Based on regulatory requirements technology status, and current environmental knowledge, the environmental issues associated with each technology area were identified. Environmental research being performed by government, industry and educational institutions was identified by computerized literature search and reviewed applicability recommended research activities for GRI funding were developed and a suitable prioritization methodology was devised GRA

N82-11275# Cornell Univ. Ithaca, N Y ETHANOL PRODUCTION IN SOUTHERN TIER EAST REGION OF NEW YORK. TECHNICAL AND ECONOMIC FEASIBILITY Final Report

Robert J Kalter Mar 1981 348 p refs Sponsored by New York State Energy Research and Development Authority (PB81-226979, Rept-81-7, NYSERDA-81-7) Avail NTIS

HC A15/MF A01 CSCL 07A

This is the third of five region-specific feasibility studies on regional production of ethanol It was found that deproteinized whey resources in this region of New York could support ethanol production in amounts ranging from about 1.5 million to 5 million gallons a year while also producing a high-protein,

high-mineral animal feed. Ethanol is an octane booster which can be used as a gasoline extender to produce gashol

N82-11276# Missouri River Basin Commission, Omaha, Nebr SYNTHETIC FUEL DEVELOPMENT FOR THE UPPER MISSOURI RIVER BASIN. SECTION 13. WATER ASSESSMENT REPORT

Apr 1981 129 p refs Sponsored in part by the Water Resources

(PB81-224537) Avail NTIS HC A07/MF A01 CSCL 21D The results of an assessment of water requirements, water supply availability and other water implication of synthetic fuel development in the Upper Missouri River Basin are summarized The availability of water to support certain hypothetical levels of synfuel development for three types of coal conversion technologies is determined. The major effects that synfuel development could have on the water resources of the region are identified

N82-11310*# Jet Propulsion Lab., California Inst. of Tech., Pasadena

AN OPTIMIZATION MODEL FOR ENERGY GENERATION AND DISTRIBUTION IN A DYNAMIC FACILITY F L Lansing In its The Telecommun and Data Acquisition 15 Oct 1981 p 206-222 refs

Avail NTIS HC A11/MF A01 CSCL 05A

An analytical model is described using linear programming for the optimum generation and distribution of energy demands among competing energy resources and different economic criteria The model, which will be used as a general engineering tool in the analysis of the Deep Space Network ground facility, considers several essential decisions for better design and operation. The decisions sought for the particular energy application include the optimum time to build an assembly of elements, inclusion of a storage medium of some type, and the size or capacity of the elements that will minimize the total life-cycle cost over a given number of years. The model, which is structured in multiple time divisions, employ the decomposition principle for large-size matrices, the branch-and-bound method in mixed-integer programming, and the revised simplex technique for efficient and economic computer use

N82-11317# Argonne National Lab , III SITE AND NEIGHBORHOOD DESIGN (SAND): DEVELOP-MENT OF SIMPLIFIED AUTOMATED BUILDING THERMAL LOAD PROCEDURES, PHASE 1

G T Diderrich and R A Hrabak Jul 1980 116 p refs (Contract W-31-109-eng-38)

ANL/CNSV-TM-68) (DE81-027138, HC A06/MF A01

NTIS

NTIS

Preliminary efforts toward the development of simplified procedures for estimating the thermal-loads of buildings are presented. The acquisition implementation, and documentation of the thermal load procedures and associated data files actually used by the five SAND participants are described DOF

N82-11318# American Society of Heating, Refrigerating and Air-Conditioning Engineers, New York Subcommittee for Simplified Energy Analysis

ENERGY ANALYSIS SAMPLE BUILDING DATA

Mar 1981 34 p refs

(Contract DE-AC01-78CS-20057)

(DE81-027188, DOE/CS-20057/T5) Avail

HC A03/MF A01

Sample building data for energy calculations necessary for the comparative analysis between the proposed energy calculation procedure and the procedures using comprehensive hourly simulation of HVAC systems are presented. The comparison calculation includes data for the terminal reheat system, double-duct system, heat reclaim system, and standard VAV system for a hypothetical 20-story office building in Washington, DC Each is evaluated in conjunction with electric centrifugal chiller and gas-fired boiler

N82-11320# Battelle Pacific Northwest Labs , Richland, Wash SAMPLING DESIGN FOR THE 1980 COMMERCIAL AND MULTIFAMILY RESIDENTIAL BUILDING SURVEY

W M Bowen, A R Olsen, and A L Nieves Jun 1981 98 p (Contract DE-AC06-76RL-01830) (DE81-028783, PNL-3883) Avail NTIS HC A05/MF A01

The extent to which new building design practices comply with the proposed 1980 energy budget levels for commercial and multifamily residential building designs (DEB-80) can be assessed by (1) identifying small number of building types which account for the majority of commercial buildings constructed in the USA (2) conducting a separate survey for each building type and (3) including only buildings designed during 1980 For each building, the design energy consumption (DEC-80) will be determined by the DOE2 1 computer program. The quantity X = (DEC-80 - DEB-80) These X quantities can then be used to compute sample statistics. Inferences about nationwide compliance with DEB-80 may then be made for each building type Details of the population, sampling frame, stratification, sample size and implementation of the sampling plan are provided

N82-11321# DCS Corp Washington, D C ASSESSMENT OF BUILDING DIAGNOSTICS

George E Courville Jul 1981 118 p refs Prepared for ORNL

(Contract W-7405-eng-26)

(DE81-027078, ORNL/Sub-80/61602/1) Avail

HC A06/MF A01

The building diagnostics requirements for in-situ or field measurements on energy consumption in conditioned spaces and on heat gain and loss in residential and nonresidential buildings are evaluated Energy audit programs, energy performance monitoring, energy flow in buildings, and use of computer technology are considered. A diagnostics program is outlined

DOE

NTIS

N82-11323# National Bureau of Standards, Washington, D.C. ENERGY ANALYSIS FOR A SAMPLE BUILDING BY THE PROPOSED ASHRAE SIMPLIFIED METHOD

T Kasuda and K Ishii Jan 1981 265 p (Contract DE-AC01-78CS-20057)

(DE81-027189 DOE/CS-20057/T4) NTIS

HC A12/MF A01

An energy analysis of a sample office building located in Washington, DC using the proposed ASHRAE method is presented Calculations for space load are presented. The calculations for the energy distribution systems (air conditioning, outdoor air control, humidity control, airduct systems) are given Equipment system calculations, and calculations for the annual energy consumption for air conditioning are presented DOE

N82-11376# Department of Energy, Washington, D C ELECTRIC POWER SUPPLY AND DEMAND FOR THE CONTIGUOUS UNITED STATES, 1981 - 1990

Jul 1981 584 p refs (DE81-027126. DC DOE/EP-0022) NTIS

HC A25/MF A01

The outlook for electric power supply and demand in the United States decade 1981 to 1990 is reviewed from the perspective of reliability and adequacy of service Electric power supply adequacy as projected for the nine Regional Reliability Council areas of the contiguous United States is reported as well as interruptible load data reported by the Councils Coeneration is discussed Each of the 27 electric regions (sub-areas of the nine Council areas) in the contiguous US are studied. A glossary of terms is given Appendices describe the Council structure, and include a copy of the ERA-411 Manual, which contains all the items to which the Councils were asked to respond The utilities with included data, the Staff Report, Estimated Electric Demand and Supply for Summer 1981, Contiguous United States dated May 1981 are included , DOE

N82-11414# Brookhaven National Lab , Upton, N Y Storage and Conversion Div

CHEMICAL HEAT PUMP PROGRAM: AN OVERVIEW
Alessio Mezzina 1981 5 p Presented at the Heat Pump
Contractors' Program Integration Meeting, McLean, Va., 2-4 Jun

(Contract DE-AC02-76CH-00016)

(DE81-025086, BNL-29592, CONF-810672-22) Avail NTIS HC A02/MF A01

Chemical heat pumps comprise reversible reactions which can be driven by low grade heat. Thermal energy is absorbed in one direction and liberated in the reverse direction, thus, serving as a basis for system designs applicable to space conditioning

or process heat management and offering the capability for high density energy storage as an integral part of the system. The program background, rationale, technology, and research and development needs are described

N82-11418# E-Tech, Inc., Atlanta, Ga INVESTIGATION OF DIRECT EXPANSION IN GROUND SOURCE HEAT PUMPS

Mark D Kalman 1981 6 p refs Presented at the DOE Heat Pump Contractors' Program Integration Meeting, McLean, Va., 2-4 Jun 1981 Submitted for publication

(Contract W-7405-eng-26)

(DE81-024139, CONF-810672-5) NTIS Avail -HC A02/MF A01

A fully instrumented subscale ground coupled heat pump system was developed, and built, and used to test and obtain data on three different earth heat exchanger configurations under heating conditions (ground cooling) Various refrigerant flow control and compressor protection devices were tested for their applicability to the direct expansion system. Undistributed Earth temperature data were acquired at various depths. The problem of oil return at low evaporator temperatures and low refrigerant velocities was addressed. An analysis was performed to theoretically determine what evaporator temperature can be expected with an isolated ground pipe, configuration with given length, pipe size, soil conditions and constant heat load. Technical accomplishments to data are summarized

N82-11419# Pittsburg Univ, Pa Dept of Mechanical Engineering

WELL-WATER-SOURCE HEAT PUMP FIELD PERFOR-MANCE STUDY

R S Dougail 1981 5 p refs Presented at the DOE Heat Pump Contractors' Program Integration Meeting, McLean, Va., 2-4 Jun 1981 Submitted for publication (Contract W-7405-eng-26)

(DE81-024136, CONF-810672-7) NTIS

HC A02/MF A01

Two well-water source heat pumps (WWSHPs) were instaled in two single-family residences in rural south-central Pennsylvania to supply heating in the winter and cooling during the summer The heat pump installations are being instrumented with an automated data gathering system for evaluating the performance of the systems. The instrumentation and data acquisition system. design was completed and a preliminary design of the control logic and data reduction software for the minicomputer to be located at the sites was obtained

N82-11477# Environmental Protection Agency, Ann Arbor, Mich Standards Development and Support Branch

AN EVALUATION OF THREE-WAY CONTROL SINGLE AND DUAL BED CATALYSTS AS APPLIED TO HEAVY-DUTY GASOLINE ENGINES

Thomas Nugent Apr 1981 30 p refs (PB81-224982. EPA-AA-SDSB-81-4) Avail HC A03/MF A01 CSCL 21G

A test program to evaluate the applicability of three-way control (TWC) and dual-bed catalysts (TWC and Oxidation Catalysts) in combination with a closed-loop control stoichiometric (feedback) carburetor on a production 1978 IHC 404 CID heavy duty gasoline engine was conducted Testing was conducted according to the Federal test procedure for the heavy-duty transient cycle The test program consisted of forty-six cold-start tests, fifty-eight confimatory hot-start tests run to insure accuracy and precision of the cold-start tests, and fourteen hot-start tests run to identify the effects of air/fuel ratio control points on NOx emissions. The effects of various combinations of catalysts, EGR, air/fuel control points, carburetor response times and air, pump capacity on emissions, fuel economy and engine power were

N82-11479# Environmental Protection Agency, Ann Arbor, Mich Office of Mobile Source Air Pollution Control

EPA EVALUATION OF THE FUEL-MAX DEVICE UNDER SECTION 511 OF THE MOTOR VEHICLE INFORMATION AND COST SAVINGS ACT

Edward Anthony Barth Jun 1981 140 p (PB81-229866, EPA-AA-TEB-511-81-10A,

HC A07/MF A01 EPA-AA-TEB-511-81-10B) Avail NTIS CSCL 13F

The 'FUEL-MAX' device is an air bleed device that replaces the EGR valve It is claimed to conserve fuel. The purpose of the EGR system is to control oxides of nitrogen (NOx) Removal of the EGR valve to install the 'FUEL-MAX' disables the EGR system and would be expected to result in a large increase in NOx emissions. Test data submitted by the applicant confirmed this prediction as well as indicating that 'FUEL-MAX' might improve fuel economy. Although the data did no adequately quatify the amount of this improvement, EPA chose to conduct confirmatory testing

N82-11480# Environmental Protection Agency, Ann Arbor, Mich Test and Evaluation Branch

EPA EVALUATION OF THE AUTOMOTIVE CYLINDER DEACTIVATOR SYSTEM (ACDS) UNDER SECTION 511 OF THE MOTOR VEHICLE INFORMATION AND COST SAVING ACT

Edward Anthony Barth May 1981 99 p (PB81-228256, EPA-AA-TEB-511-81-7) HC A05/MF A01 CSCL 13F

as a means of increasing a vehicle's fuel economy

NTIS

The conclusions of the evaluation of the automotive cylinder deactivator sytem device under provisions of Section 511 of the Motor Vehicle Information and Cost Savings Act are announced This device is designed to deactivate engine cylinders

N82-11524# Water Resources Council, Washington, D.C. GREAT PLAINS GASIFICATION PROJECT, MERCER COUNTY, NORTH DAKOTA; WATER ASSESSMENT REPORT SECTION 13(C)

Dec 1980 46 p refs Prepared in cooperation with Missouri

River Basin Study Group
(PB81-216111) Avail NTIS HC A03/MF A01 CSCL 08H

The features and location of a project to produce synthetic fuels from a coal gasification plant are described as well as the design of the plant and the support activities, such as mining and reclamation. The availability of the water supply is discussed including competing uses and water rights. The impacts of plant operations on water quantity and quality are assessed for the Missouri and Knife Rivers and for ground water levels. Changes to wetlands are also considered

N82-11525# Water Resources Council, Washington, D.C. GREAT PLAINS GASIFICATION PROJECT, MERCER COUNTY, NORTH DAKOTA; WATER ASSESSMENT REPORT

4 Aug 1980 14 p refs Prepared in cooperation with Missouri River Basin Study Group

(PB81-216129) Avail :NTIS HC A02/MF A01 CSCL 08H A water assessment of synfuels development in the Upper Missouri River Basin was conducted. Findings assessment show that water supplies are physically available within the mainstream of the Missouri River in North Dakota to supply the requirements of the gasifiction facilities and the supporting activities -- mining and reclamation, electricity, and project-induced population

N82-11635# Applied Physics Lab , Johns Hopkins Univ , Laurel,

ENERGY PROGRAMS AT THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY Quarterly Progress Report, Jan. - Mar. 1981

R vonBriesen.' J E Tillman, F C Paddison, C S Leffel, 'Jr. and S Kane Apr 1981 44 p refs (Contracts DOE-EX-76-A-36-1008, DE-A101-79ET-27025)

JHU/APL/EQR/81-1) (PB81-218141. Avail

(PB81-218141. JHU/APL/E HC A03/MF A01 CSCL 08G

The laboratory is engaged in developing energy resources, utilization concepts, and monitoring and storage methods. The report is divided into three sections. The first, geothermal energy development planning and technical assistance, contains reports on the progress of geothermal related tasks on which effort was concentrated during the quarter. The second section, siting of critical facilities, contains reports on geologic investigations in western Connecticut and areas in adjacent New york, development of seismotectonic domains, and fracture permeability in siting hazardous waste repositories. The third section, energy conservation and storage techniques, reports on institutional barriers to landfill methane recovery and the need for state legislation

N82-11574# Oak Ridge National Lab., Tenn Health and Safety Research Div

ENERGY ANALYSIS OF HUMAN ECOSYSTEMS IN AN APPALACHIAN COAL COUNTY

A P Watson 1980 31 p refs Presented at the Intern Symp on the Human Side of Energy, Laramie, Wyo. 7-9 Jul

(Contract W-7405-eng-26)

(DE81-025177, CONF-8007 107-2) HC A03/MF A01

Avail NTIS

Preliminary results from a energy analysis of the coal fuel cycle in an Appalachian coal county has provided systematic assessment of hidden energy subsidies in extraction, transport, processing, and combustion Current results indicate a major loss due to depletion of the coal resource base by use of inefficient mining techniques. Although of smaller magnitude, reductions in work force and community productivity from occupational accidents and disease and road maintenance requirements for transport also appear to be significant

N82-11589# Brookhaven National Lab , Upton, N Y National Center for Analysis of Energy Systems

MODELING ENERGY-CONSERVATION POTENTIALS OF COMMUNITY ENERGY-SYSTEM TECHNOLOGIES

Peter I Kleeman 1981 8 p refs Presented at 12th Ann Pittsburg Conf. on Modeling and Simulation, 30 Apr. - 1 May

(Contract DE-AC02-76CH-00016)

(DE81-026059, BNL-29720, CONF-810477-2) Avail NTIS HC A02/MF A01

A mathematical model is presented for estimating energyconservation potentials of community-energy-system technologies in meeting community energy service demands. The model is formulated to identify optimal community composition, technology choices, and fuel use under various fuel price, energy service demand, and other system-parameter assumptions DOF

N82-11613# Department of Energy, Washington, D.C. Office of Policy, Planning and Analysis

INTERRELATIONSHIPS OF ENERGY AND THE ECONOMY: A SUPPLEMENT TO THE NATIONAL ENERGY POLICY PLAN REQUIRED BY TITLE VIII OF THE US DEPARTMENT OF ENERGY ORGANIZATION ACT (PUBLIC LAW 95-91)

Jul 1981 70 p refs (DE81-027526, E

DOE/PE-0030)

HC A04/MF A01

This study developed a fairly wide range of estimates for the impact of energy prices on such key variables as real gross national product, inflation, and the US trade balance. The retrospective analysis suggests that potential economic output in the near future is being affected adversely by such energy price results from the recent past as lower investment, reduced labor force participation, slower growth in labor productivity, and reduced access to real energy resources. Policies that seek to stimulate the supply side of the economy (including policies that seek to stimulate the specific development of energy resources) are directed at offsetting such past effects 1981-90 projections are presented of the impacts upon the economy in the three energy price scenarios developed in the document Energy Projections to the Year 2000

N82-11614# Wisconsin Center for Public Policy, Madison SOLPLAN REPORT: AN ASSESSMENT OF BARRIERS AND INCENTIVES TO CONSERVATION AND ALTERNATIVE-ENERGY USE IN THE RESIDENTIAL SECTOR IN WISCON-SIN

C K Fulenwider, Lonnie S Weiss, Carol Pfefferkorn, Don E Wiener, and Stephen L Feldmam Mar 1981 453 p (Contract DE-FG02-79CS-30292)

(DOE/CS-30292/3) Avail NTIS HC A20/MF A01

The Alternative Energy Policy Project of the Wisconsin Center for Public Policy focused upon two principle objectives gathering the heating industry generally, the alternative-energy industry commercialization, and building consensus around alternative energy policy to develop guidelines for alternative energy policy for the state. Particular attention was paid to public involvement in the policy process and to assessing barriers and incentives from as many key sectors of the energy field as possible Data were gathered from the general public, alternative energy users. the heating industry generally, the alternative-energy industry specifically, and key decision makers

N82-11616# South Carolina Energy Research Inst., Columbia RESIDUAL-ENERGY-APPLICATIONS PROGRAM: EAST-**FACILITY REQUIREMENTS DOCUMENT**

P W Yngve and F H Zander 31 Jul 1981 237 p refs (Contract DE-AC09-77ET-12866)

(DE81-027489, DOE/ET-12866/8-Vol-2) HC A11/MF A01 NTIS

The objectives of the EAST facility are to perform research and development on heat energy recovery and conversion equipment, establish high confidence in system performance. system availability, and system operating, maintenance, and material costs, and provide a national competence in technologies required for the installation and operation of heat recovery systems Detailed descriptions of seven potential test articles which represent a wide range of types and sizes of heat recovery systems were contained EAST operations, including test planning, test policies, systems testing, and facility organization and staffing were discussed. Additionally, information is included on a preliminary site analysis for the EAST Facility and other test support system requirements are described

N82-11624# State Univ of New York at Albany SITE SELECTION FOR SMALL WIND ENERGY CONVER-SION SYSTEMS FOR US DEPARTMENT OF ENERGY FIELD **EVALUATION PROGRAM**

Bruce H Bailey Oct 1980 67 p Sponsored by New York State Energy Research and Development Authority (PB81-226862. NYSERDA-81-2)

HC A04/MF A01 CSCL 10A

The site selection procedure followed to locate two qualified sites for the installed and monitoring of two commercially available small wind energy conversion systems as part of the U.S. Department of Energy's Field Evaluation Program is described The aim of the evaluation program is to gain operating experience with wind systems in actual locations and to identify the siting and operational issues involving wind energy conversion systems. The two sites selected were approved as test sites for the program GRA

US ENERGY STRATEGIES: SOME OPTIONS FOR ELIMINA-TING OIL IMPORTS BY THE YEAR 2000

Edward G Sharp, Elaine G Carlson, Daniel J Entingh, John J Fearnsides, Robert P Foreman, Willard E Fraize, David Gray, Rodney K Lay, John G Leigh, Milton Lytton et al Apr 1981

23 p refs (PB81-226052. MTP-81W0002) Avail NTIS HC A02/MF A01 CSCL 10A

Topic areas discussed include reasonable choices which eliminate the need for oil imports, potential domestic liquid fuel supplies, capital requirements for increased domestic liquid fuel supplies, potential for reducing liquid fuels demand, and domestic natural gas. Other domestic energy resources and future domestic energy demands are discussed

N82-11627# National Highway Traffic Safety Administration, Washington, D C Technology Assessment Div

THIRD AUTOMOTIVE FUEL ECONOMY RESEARCH CONTRACTORS COORDINATION MEETING
Charles L. Gauthier, ed Dec 1980 777 p refs Proceedings of Conf held in Washington, D.C., 1-2 Dec 1980

(PB81-222754) Avail NTIS HC A99/MF A01 CSCL 10A

Topic areas covered include industry analyses, driver energy conservation, heavy duty trucks, consumer research and market demand, vehicle weight reduction, and diesel engine studies are presented Spark ignition engine and drivetrain improvements

N82-11641# Acurex Corp., Mountain View, Calif and Environmental Div

KINETICS OF NO/ SUB X FORMATION DURING EARLY STAGES OF PULVERIZED-COAL COMBUSTION Quarterly Report, 4 Apr. - 30 Jun. 1981

W V Krill, E K Chu, G C Snow, S Pessagno, and H Tong 31 Jul 1981 54 p refs

(Contract DE-AC22-80PC-30295)

(DE81-029071, DOE/PC-30295/3, QR-3) Avail NTIS HC A04/MF A01

Kinetics of NO/sub x/ formation during early stages of

لها التالوسية العالم الماليان

pulverized coal combustion, are reported. The well stirred nature of the reactor gas phase region and coal transport air are verified in cold flow and combustion tests. A single pass trajectory of coal paticles through the stirred region was achieved Preliminary thermal NO/sub x/ formation characteristics of the gas phase and the reactor temperature environment are measured for use with the kinetic model

N82-11642# Acurex Corp , Mountain View, Calif SURVEY OF PARTICULATE EMISSION MACRO AND MICRO-SAMPLING AND SIZING METHODS

William O Lipscomb Feb 1981 116 p refs (Contract DE-AC18-80FC-10193)

(DE81-028348, DOE/FC-10193/T1, Acurex-TR-81-01/SR) Avail NTIS HC A06/MF A01

Methods for sampling and fractionating flue gas particulates were developed. The survey was composed of three parts (1) macro methods. (2) micro methods, and (3) real timemonitoring/sizing methods. A survey and cursory evaluation of commercially available macro, micro, and real time measurement systems is presented it is concluded that macro and micro methods utilizing impactors and cyclones are available

N82-11644# Argonne National Lab , III Energy and Environmental Systems Div

SOLID AND HAZARDOUS ENERGY WASTES: SYNFUELS. 1: REVIEW OF RESEARCH ACTIVITIES

L Fradkin, T Surles, and W DeCarlo May 1981 164 p refs Sponsored in part by EPA

NTIS

(Contract W-31-109-eng-38) (DE81-028503.

ANL/EES-TM-142)

HC A08/MF A01

Chemical and biological research on solid, liquid, and gaseous waste streams from coal conversion and oil shale technologies is summarized. Brief descriptions, the objectives, current activities, and future plans, of ongoing projects were obtained References to publications that resulted from the various research projects are included. References to work on hazardous and solid synfuel waste are included in the appendixes

N82-11646# California Univ. Berkeley Lawrence Berkeley Lab Energy and Environment Div

INTERGRATED ASSESSMENT FOR ENERGY-RELATED ENVIRONMENTAL STANDARDS: A SUMMARY OF ISSUES AND FINDINGS

John P Holdren Oct 1980 60 p refs

(Contract W-7405-eng-48)

(DE81-028552, LBL-12779) Avail NTIS HC A04/MF A01

Environmental impacts of energy technologies arise from many stages in the flow of an energy source from discovery to end-use. propagate via disruptions in many media, and manifest themselves as many different undesirable effects. The aim of the investigation is to understand the capacities and limitations of the assessment mechanisms available for use in the formulation of environmental standards applied to energy technologies TM

N82-11651# Lovelace Biomedical and Environmental Research Inst , Albuquerque, N Mex Inhalation Toxicology Research Inst

LOW-BTU-GASIFIER EMISSIONS TOXICOLOGY Status Report, Dec. 1980

R F Henderson, ed Apr 1981 67 p refs (Contract DE-AC04-76EV-01013)

(DE81-031000, LMF-85) Avail NTIS HC A04/MF A01

Inhalation hazards to plant workers and the general population that may be associated with low Btu coal gasification were assessed. To achieve this goal, it is necessary to characterize the potential toxicants in liquid and solid process and waste streams. The experimental low Btu gasifier at METC was sampled to determine aerosol components in gaseous process streams and to assess potential toxicants in liquid and solid effluent streams

N82-11652# Arizona Univ., Tucson Dept of Mining and Geological Engineering SULFUR POLLUTION CONTROL. PHASE 1:

DISPOSAL PROGRAM Final Report, Sep. 1978 - Jun.

Michael Rieber, Benjamin Okech, and Roger Fuller Jan 1981 263 p refs

(Contract DI-BM-JO-88144) (PB81-222612. BM-OFR-94(3)-81) NTIS Avail. HC A12/MF A01, also available in set of 4 reports HC E99 CSCL 07A

Sulfuric acid production from sulfur based acid plants and smelters is analyzed and industry competition, with particular emphasis on voluntary versus abatement acid, is reviewed Production costs for both acid plants and smelters are estimated Large scale users prefer sulfur based acid production if the heat value of the reaction is utilized as a steam credit Voluntary acid is a more stable supply source than smelter acid. Voluntary acid output is a reaction to price and demand conditions. An output forecast is made based on APC regulations, implementation, and estimated metals production

N82-11654# Exxon Research and Engineering Co. Florham CONTROL OF UTILITY BOILER AND GAS TURBINE POLLUTANT EMISSIONS BY COMBUSTION MODIFICA-TION, PHASE 2 Final Report, Jun. 1976 - Jun. 1979 E H. Manny and A R Crawford Mar 1981 178 p refs (Contract EPA-68-02-1415) (PB81-222267, EPA-600/7-81-039; EE 5E 81) Avail NTIS HC A09/MF A01 CSCL 13B

The applicability of combustion modification (CM) techniques to control NOx and other pollutant emissions from utility boilers and gas turbines without causing deleterious side effects was studied Comprehensive, statistically designed tests were used to evaluate the effect of CM. In staged low excess air tests of low-NOx, dual-fired utility boilers, special attention was paid to the determination of potentially adverse side effects, increased combustible emissions, unwanted changes in particulate mass loading and size distribution, reduced boiler efficiency, increased furnace slagging, and tube wall corrosion may be applied to coal fired utility boilers. The extent of furnace tube wall corrosion and slagging could not be determined conclusive

N82-11655# Arizona Univ., Tucson Dept of Mining and Geological Engineering.
SULFUR POLLUTION CONTROL. PHASE 1: THE DISPOSAL PROGRAM (SECTIONS 5 THROUGH 7) Final Report Michael Rieber, Roger Fuller, and Osmario Dellaretti Jan. 1981 190 p refs (Contract DI-BM-JO-188144) BM-OFR-94(2)-81) (PB81-222804, NTIS HC A09/MF A01 CSCL 13B

Sulfur recovery from domestic sour natural gas and petroleum refining on a current basis and projected to the mid-1990's on a regional basis was estimated. The current basis depends importantly on gas production projection for the Overthrust Belt and the associated H2S. The regional basis depends on projected increases in the sulfur content and weight of imported crude oils, total crude oil imports, and anticipated refinery response

N82-11657# TRW, Inc., McLean, Va **Energy Systems** Group

ENVIRONMENTAL RESEARCH PLAN FOR GAS SUPPLY TECHNOLOGIES. VOLUME 1: EXECUTIVE SUMMARY Final Report

L M Tipton and P D. Junkin 29 May 1981 78 p refs 2 Vol.

(Contract GR1-5080-351-0316) (PB81-222309.

GRI-80/0013 1) NTIS Avail: HC A05/MF A01 CSCL 21D

The environmental impacts and constraints associated with gas supply technologies are summarized. Specific environmental research needs based on state of the art technology and current environmental knowledge are identical Technologies considered include those producing, unconvential natural gas (tight gas sands, Devoian shale, coalbed methane, and geopressured methane), SNG from coal and peat and SNG from biomass (land based, water based and waste

N82-11661# Research Triangle Inst., Research Triangle Park. VAPOR-PHASE CRACKING AND WET OXIDATION AS POTENTIAL POLLUTANT CONTROL TECHNIQUES FOR COAL GASIFICATION Final Report, Nov. 1976 - Apr. 1981

W J McMichael, S K Gangwal, D A Green, and F. O Mixon Jun. 1981 56 p refs (PB81-219594; RTI/1934/00-01F, EPA-600/7-81-096) Avail: NTIS HC A04/MF A01 CSCL 13B

Bench-scale experiments were used to deterimine rates of hydrocracking and wet oxidation as a function of process conditions and catalyst used A microreactor system, capable of holding 10 cc of material to be screened for catalytic activity. was used in the hydrocracking studies. Benzene and alkylated benzene compounds were used as model compounds in determining the potential of various materials fo cracking rates. Thiophene was used as a model compound for catalyst poisoning studies. Cracking rates were determined for coal-derived materials produced from bituminous and subbituminous coals and materials containing iron and nickel compounds

N82-11671# Environmental Protection Agency, Las Vegas, Nev Exposure Assessment Research Div

GEOTHERMAL ENVIRONMENTAL ASSESSMENT: BEHAV-IOR OF SELECTED GEOTHERMAL BRINE CONTAMINANTS

IN PLANTS AND SOILS Finel Report
K. W. Brown Jun 1981 36 p refs
(PB81-222333. EPA-600/4-81-052)

NTIS Avail HC A03/MF A01 CSCL 13B

The behavior of selected elements found in the Roosevelt Hot Springs KGRA geothermal fluids was investigated in both plant and soil systems. The kinetics of these potential environmental containments were studied by using soil columns and selected cultivated and native plant species

N82-11679# PEDCo-Environmental, Inc., Cincinnati, Ohio EPA UTILITY FGD (FLUE GAS DESULFURIZATION) SURVEY Quarterly Report, Jan. - Mar. 1981

M Smith, M Melia, N Gregory, and K Scalf Aug 1981 308 p refs

(Contract EPA-68-01-6310)

(PB81-225773. EPA-600/7-81-012C) HC A14/MF A01 CSCL 13B NTIS

Information contributed by the utility industry, process suppliers, regulatory agencies, and consulting engineering firms is summarized. Domestic FGD systems are tabulated alphabetically by development status (operational, under construction, or in planning stages), utility company, process supplier, process and waste disposal practice Data on boiler design, FGD system design, fuel characteristics, and actual performance are presented Unit by unit dependendability parameters, and problems and solutions associated with the boiler and FGD systems are discussed Process flow diagrams and FGD system economic data are also presented T M

N82-11680 Maryland Univ , College Park SELECTED STUDIES OF FOUR HIGH-TEMPERATURE AIR-POLLUTION SOURCES Ph.D. Thesis Mark Steven Germani 1980 406 p

Avail. Univ Microfilms Order No 8121096 The atmospheric emissions of five copper smelters, a coal-fired power plant, a municipal incinerator and the Mt. Erebus volcano in Antarctica were examined. Many chalcophilic elements, e.g., As, Se, Pb, Cd, Zn, W and in, are strongly enriched with respect to the Earth's crustal abundance pattern in particulate material emitted from copper smelters. Vapor-phase concentrations of several elements in a high temperature gas stream and tested at a coal-fired power plant were determined and compared with those from a municipal incinerator. The results from the coal-fired power plant and incinerator indicate that 5-10 times more Hq is emitted from the power plant Particulate and vapor-Erebus show large enrichments for many elements, most notably the volatile charcophilic elements, As, Se, In, Cd and Sb, and the halogens, F Cl and Br. About 95% of the Cl, 24% of the As and > 90% of the F are present in the vapor phase High concentrations of F are present in the lava lake as evidenced by the ratio of CI to F found in the vapor-phase samples

Dissert Abstr

N82-11712# California Univ , Livermore Lawrence Livermore Lab COMPUTER MODELS TO SUPPORT INVESTIGATIONS OF SURFACE SUBSIDENCE AND ASSOCIATED GROUND MOTION INDUCED BY UNDERGROUND COAL GASIFICA- R T Langland and B C. Trent (Science Applications, Inc., Steamboat Springs, Colo) 1981 14 p refs Presented at the 7th Ann Underground Coal Conversion Symp. Fallen Leaf Lake, Calif , 8-11 Sep 1981 (Contract W-7405-eng-48)

(DE81-027131, UCRL-86437, CONF-810923-1) Avail NTIS HC A02/MF A01

Two computer codes compare surface subsidence induced by underground coal gasification at Hoe Creek, Wyoming, and Centralia, Washington Calculations with the STEALTH explicit finite-difference code are shown to match equivalent implicit finite-elemet method solutions or the removal of underground material Effects of removing roof material, varying elastic constants, investigating thermal shrinkage, and burning multiple coal seams are studied. A coupled finite-difference continuum rigid-block caving code is used to model underground opening behavior. Numerical techniques agree qualitatively with empiricial studies but, so far, underpredict ground surface displacement. The two methods, numerical and empirical, are most effective when used together It is recommended that the thermal characteristics of coal measure rock be investigated and that additional calculations be carried out to longer times so that cooling influences can be modeled

N82-11731# Massachusetts Inst of Tech., Cambridge OCEANS AND OCEAN CURRENTS: THEIR INFLUENCE ON CLIMATE

Reginald E Newell, Long S. Chiu, Wesley Ebisuzaki, Alfredo Navato, and Henry B Selkirk 1980 56 p refs Presented at the Conf on Climate and Offshore Energy Resources, London, 21 Oct 1980 Sponsored in part by the National Science Foundation, Washington, D.C.

(Contract DE-AS02-76EV-12195)

(DE81-027263, DOE/EV-12195/41, CONF-8010198-2) Avail NTIS HC A04/MF A01

Particular attention is given to influences that may be related to offshore energy generation. The role of the ocean currents and seasonal, as well as nonseasonal variations, are discussed The effects of the Southern Oscillation, a non-seasonal signal in the climate system second only to the Ice Ages, are empha-

N82-11985# PEDCo-Environmental, Inc., Cincinnati, Ohio FGDIS PRIMER: MAJOR EQUIPMENT/COMPONENT CLASSIFICATIONS, PROBLEM/SOLUTION ACCESS CODES, AND DEFINITIONS RELATED TO FGD SYSTEMS AS CONTAINED IN THE FLUE GAS DESULFURIZATION INFORMATION SYSTEM (FGDIS)

May 1981 135 p

(Contract EPA-68-02-3173)

(PB81-225948) Avail NTIS HC A07/MF A01 CSCL 05B The major equipment and component classification used in the Flue Gas Desulfurization Information system is presented Such things as the problem and solution codes used in conjunction with the FGD system performance data, as well as definitions of common terminology used to describe FGD systems and power plants in geneal are included. Along with the classifications of the various complex equipment items and components that comprise FGD systems, brief functional descriptions and illustrations are provided

N82-11988# Los Alamos Scientific Lab , N Mex NATIONAL COAL-MARKET CONDITIONS FOR THE YEAR 2000: REGIONAL-ISSUE IDENTIFICATION AND ANALY-SIS, HIGH SCENARIO

Frank Wolak Jul 1981 18 p refs

(Contract W-7405-eng-36)

(DE81-026425, LA-8906-MS) Avail NTIS HC A02/MF A01

Coal market data inputs necessary to operate the model used for the solid-waste impacts of coal-fired electricity production are described The ROCKY3 model generated minemouth prices and quantities produced for each coal type from each coal supply region and the delivered price and quantity to each coal consumption region of each coal type from all of the coal supply regions DOF

N82-11994*# Jet Propulsion Lab , California Inst of Tech , Pasadena EVALUATION OF THE MICRO-CARBURETOR

Merkel F Weiss, Robert A Hall, and Steven D Mazor Aug 1981 83 p refs (Contracts NAS7-100, DE-AI01-79CS-50080) (NASA-CR-164958; NTIS JPL-Pub-81-75) Avail

HC A05/MF A01 CSCL 13F A prototype sonic, variable-venturi automotive carburetor was evaluated for its effects on vehicle performance, fuel economy, and exhaust emissions. A 350 CID Chevrolet Impala vehicle was tested on a chassis dynamometer over the 1975 Federal Test Procedure, urban driving cycle The Micro-carburetor was tested and compared with stock and modified-stock engine configurations Subsequently, the test vehicle's performance characteristics were examined with the stock carburetor and again with the Micro-carburetor in a series of on-road driveability tests The test engine was then removed from the vehicle and installed on an engine dynamometer Engine tests were conducted to compare the fuel economy, thermal efficiency, and cylinder-tocylinder mixture distribution of the Micro-carburetor to that of the stock configuration. Test results show increases in thermal efficiency and improvements in fuel economy at all test conditions Improve fuel/air mixture preparation is implied from the information presented. Further improvements in fuel economy and exhaust emissions are possible through a detailed recalibration of the Micro-carburetor Author

N82-11995# California Univ. Berkeley Lawrence Berkeley Lab

URBAN ECOSYSTEM AND RESOURCE-CONSERVING URBANISM IN THIRD WORLD CITIES

R L Meier, Sam Berman, Tim Campbell, and Chris Fitzgerald Mar 1981 195 p refs (Contract W-7405-eng-48)

(DE81-029854, LBL-12640) Avail NTIS HC A09/MF A01

A comprehensive overview based on urban ecosystems was employed in field studies of representative cities in developing regions. The rising overall demand of cities in the developing regions was examined with emphasis on petroleum and caloric foodstuffs. Policies necessary to conserve energy and to adapt to increased costs and the possibility of food and water shortages are addressed

N82-12204# Starck (Hermann C) Berlin, Goslar (West Germany). Werk Goslar

DEVELOPMENT OF A PROCESS FOR RECOVERY OF VALUABLE COMPONENTS FROM COMPLEX HYDRODE-SULFURIZATION CATALYSTS ESPECIALLY TUNGSTEN. MOLYBDENUM, VANADIUM, NICKEL AND COBALT Final Report

Bruno Krismer, Hans-Georg Nadler, and Hartmut Pungs Bonn Bundesministerium fuer Forschung und Technologie Dec 1980 20 p In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-80-186, ISSN-0340-7608) NTIS Avail HC A02/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 4.20

For the nonpolluting recovery of the valuable components W. Mo, Co, Ni and V from complex hydrodesulfurization catalyst residues, an economical process was developed in which the valuable elements are reduced out by carbothermal reactions in the electric arc furnace as a first process step. The metal obtained is ground, roasted, and the oxides are dissolved in a combined acid-base dissolving process. The valuable elements are separated by liquid-liquid extraction steps which make it possible to isolate the valuable materials in the desired grade of chemical Author (ESA)

N82-12205# Ruhrchemie A.G., Oberhausen (West Germany) Abt Umweltschutz

THERMAL PROCESSING OF USED CATALYSTS Final Report

Dieter Ernst and Sebastien Speth Bonn Bundesministerium fuer Forschung Technologie Dec 1980 24 p refs In GERMAN. ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

ISSN-0340-7608) NTIS (BMFT-FB-T-80-189, Avail HC A02/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 5,05

A preliminary treatment of the used catalysts following fluidized bed thermal processing is presented It is possible to obtain a starting material free from organic impurities, which is suited to the usual recovery of the valuable components of the

catalysts in the course of the operation optimization, it was possible to successfully complete the feeding of the fluidized bed reactor with used catalysts from widely varying sources The waste gas purification and fine dust separation comply with emission regulations. The unit is to be regarded as a demonstration plant, especially if waste heat utilization can be integrated to Author (ESA) improve economic performance

N82-12278# Aerospace Corp., El Segundo, Calif Energy and Resource Div

SOLAR HEATING AND COOLING OF BUILDINGS (SHA-REQUIREMENTS DEFINITION AND IMPACT ANALYSIS-2. VOLUME 1: ENERGY-CONSERVING DESIGN FOR RESIDENTIAL STRUCTURES

C K Cretcher Nov 1980 140 p refs Sponsored by Electric Power Research Inst

(EPRI Proj 553-2)

(DE82-900206, EPRI-EM-1506-Vol-1) NTIS Avail

HC A07/MF A01

The impact of stringent energy conserving building standards on electric utility service areas and their customers was analyzed The demands on the seven broadly representative electric utilities were aggregated to represent the total new construction electric heating demands in the years 1990 and 2000 to be compared to the aggregate obtained similarly for a nominal, less stringent standard, viz , ASHRAE 90-75 Results presented include the percentage of energy savings achieved in both heating and cooling seasons and typical demand profile changes. A utility economic impact analysis was performed for the cases investigated to determine changes in operating costs and potential capacity sales A third cost component considered is the incremental cost of superinsulation (over ASHRAE 90-75) to the customer The aggregate net cost to the utility/customer entity is utilized as a measure of overall economic benefit

N82-12283# Midwest Research Inst., Golden, Colo Solar **Energy Research Inst**

COMPARISON OF RESIDENTIAL WINDOW DISTRIBU-TIONS AND EFFECTS OF MASS AND INSULATION

M Hannifan, C Christensen, and R Perkins Jul 1981 refs Presented at the 6th National Passive Solar Conf., Portland, Oreg: 8-12 Sep 1981

(Contracts DE-AC02-77CH-00178; EG-77-C-01-4042) (DE81-027938, SERI/TP-721-1300, CONF-810925-9)

NTIS HC A02/MF A01

The energy requirements and comfort implications of various window distributions and window areas (representing conventional, sun-tempered, and passive solar designs) are investigated for single-family residences in Albuquerque, NM. Denver, CO, and Madison, WI Three distinct mass levels ranging from lightweight to heavyweight interiors and three distinct insulations levels, including energy-conserving, night-insulated, and superinsulated cases, are analyzed Energy requirements are reported for residences with electric resistance heating and mechanical air conditioning. Comfort conditions reported are based on interior ,DOE average air temperatures and mean-squared errors

N82-12403# Weiss Technik G m b H . Reiskirchen (West Germany)

PRACTICAL DEMONSTRATION OF HEAT PUMPS FOR UTILIZATION OF ANIMAL-GENERATED HEAT Final Report

Hans-Ulrich Amberg Bonn Bundesministerium fuer Forschung und Technologie Sep 1980 47, p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-80-100, ISSN-0340-7608) Avail HC A03/MF A01, Fachinformationszentrum, Karlsruhe, West

Germany DM 10.30

Airconditioning of pigpens to eliminate effects of temperature extremes is reported. A stall air conditioner was, installed as heat pump in a pigpen for final fattening. The heat, recovered from the exhaust air, is supplied to the outside air so that heated fresh air is blown into the stall. The test was accomplished on a farm with intensive pig breeding with 120 preliminary fattening places and 240 final fattening places. The stall air conditioner offers the possibility to attenuate the extreme temperature variations during the year

N82-12404# Escher Wiss G m b H , Ravensburg (West Germany) Abt Papiermaschinen

AIR CIRCUIT WITH HEATING PUMP Final Report

Herbert Holik, Hans Joachim Bauder, Hubert Brugger, Anton Reinhart, and Karl-Heinz Spott Bonn Bundesministerium fuer Forschung und Technologie Dec 1980 56 p refs In GERMAN. Sponsored by Bundesministerium fuer ENGLISH summary Forschung und Technologie

ISSN-0340-7608) NTIS (BMFT-FB-T-80-188, Avail HC A04/MF A01, Fachinformationszentrum, Karlsruhe, West

Germany DM 11,80

A pump which draws energy from exhaust air from a paper drying process to heat up the blow air was studied. The use of a heat pump instead of a steam heated exchanger can reduce primary energy consumption for blown air heating by more than half and the costs for air heating up to half. The amortization times for the heat pump extend from 5 to 10 years. Since in the pulp and paper industry, amortization times of less than two years are required for such relatively small investments, the heat pump so far is only used to heat blown air under highly favorable conditions. The rising energy prices shorten the heat pump amortization time. The 100% fuel price increase brought the heat pump with diesel engine drive already to very favorable amortization times of 2 to 5 years. A 20% increase will make the heat pump economically advantageous with an amortization time between 1 and 2 years Author (ESA)

N82-12424# Unitex Corp., Salt Lake City, Utah HIGH-TEMPERATURE COUNTER-FLOW RECUPERATOR Final Report

F Rudloff May 1981 324 p refs (Contract DE-AC07-80ID-12077) (DE81-031923, DOE/CS-12077/T1)

NTIS Avail

HC A14/MF A01

The commercial potential of a helical recuperator design in recovering waste heat from industrial furnaces is reported. The helical recuperator concept consists of a cylindrical column with an interior helical interface which separates the preheat air and the combustion gas. The column operates in a teer flow mode and is formed from modular sections. The material evaluation consisted of exposing material samples to a soda-lime glass furnace environment for a fifteen week period ECP-3, X-81, and Unichrome were the best suited for use in a soda-lime environment and ECP-3 was the best candidate with raspect to manufacturing. Two potential design modifications were identified a finned design and a double helix design. For materials that showed the greatest potential for use in the glass environment. the double helix design made from ECP-3 was the most economical producing payback periods of 6 to 14 years

N82-12513# Washington Univ , Seattle CHEMICAL AND GEOCHEMICAL STUDIES OFF THE COAST OF WASHINGTON Progress Report, Sep. 1980 - Jul 1981 R Carpenter, comp Jul 1981 14 p refs (DE81-030319. DOE/EV-70024/44) NTIS HC A02/MF A01

A series of marine chemical and geochemical investigations involving both laboratory studies and field studies off the coast of Washington is addressed. Most of the field work was on the Washington continental shelf, slope, and the submarine canyons indenting the shelf north of the Columbia River. The aim is to provide basic data required to characterize underlying chemical and physical processes and their rates which control the distributions, concentrations, and ultimate fate of some of the potentially hazardous agents associated with fossil fuel and/or nuclear power production or transportation. Laboratory and field experiments and theories derived from are used iteratively to investigate (1) vertical transfer of trace chemicals from surface seawaters to underlying waters and sediments, (2) processes which may transfer certain chemicals from sediments back into the overlying water column, (3) redox processes which besides changing valence states of certain chemicals may alter their precipitation/dissolution tendencies, their biological availability and/or toxicity, and (4) accumulation histories of potentially hazardous chemicals in sediments during the past 100 years

N82-12521# Skelly and Loy, Harnsburg, Pa FEASIBILITY ANALYSIS OF TRENCH STRIP AND AUGER **MINING Summary Report**

Jun 1981 209 p refs (Contract DE-AC01-79ET-11268)

(DE81-027557 DOE/ET-11268/14) Avail

HC A10/MF A01

The feasibility of using Trench Strip and Auger Mining as a means to extract coal reserves which are presently considered uneconomical to mine or which would present undesirable environmental effects if extracted using conventional surface mining methods is assessed. The conclusion is that Trench Strip and Auger Mining, when used as a primary mining system, is a viable alternative to conventional surface mining Economically, a savings in the selling price of at least \$12 per ton (from \$28 to \$16) can be realized with this concept. Environmentally, the amount of surface area disturbed can be reduced to half, and the amount of overburden handled can be reduced to one-seventh that of a conventional mine It was also discovered that the trench mine gave similar results on certain surface minable sites that are economically and environmentally sound

N82-12526# Department of Energy, Washington, D. C. Assistant Administrator for Applied Analysis

ANALYSIS REPORT: APPLIED ANALYSIS MODEL SUMMARIES

Dec 1980 173 p (DE81-029278,

DOE/EIA-0293)

NTIS

Avail

NTIS

HC A08/MF A01 Brief statements of each model's purpose are presented Information on the models' characteristics, uses, and requirements is provided and sources for additional information are reported

N82-12579# Department of Energy, Washington, D C DEPARTMENT OF ENERGY PROJECTS Quarterly Status Report

30 Jun 1981 525 p

(DE82-000038, DOE/MA-0006/2)

NTIS Avail

HC A22/MF A01

The report is designed to provide Department of Energy (DOE) management with a summary of the important baseline data that exists in the DOE project data base. This data base is maintained chiefly from periodic field management reports required by DOE Order 5700 4 Since most of the current estimates in this report are from field project managers, they do not necessarily have full headquarters approval. The current budget data sheet estimates that appear in the report are considered appropriate for reporting external to the Department DOF

N82-12580# Data Resources, Inc., Lexington, Mass MODELS FOR FORECASTING ENERGY USE IN THE US FARM SECTOR Final Report

R Christensen Electric Power Research Inst Jul 1981 200 p refs Sponsored by Electric Power Research Inst (EPRI Proj 682-1)

(DE81-904220, EPRI-EA-1956-Vol-1) NTIS

HC A09/MF A01

Econometric models were developed and estimated for the purpose of forecasting electricity and petroleum demand in US agriculture. A structural approach is pursued which takes account of the fact that the quantity demanded of any one input is a decision made in conjunction with other input decisions. Three different functional forms of varying degrees of complexity are specified for the structural cost function, which describes the cost of production as a function of the level of output and factor prices. Demand for materials (all purchased inputs) is derived from these models. A separate model which break this demand up into demand for the four components of materials is used to produce forecasts of electricity and petroleum is a stepwise manner DOE

N82-12581# Merix Corp., Wellesley, Mass ENERGY CONSERVATION IN DISTILLATION Final Report W Mix, J S Dweck, M Weinberg, and R C Armstrong Jul 1981 299 p refs (Contract DE-AC07-76CS-40259) (DE81-028650, DOE/CS-40259/1) NTIS Avail. HC A13/MF A01

An audit of major industrial and processes and key colums in each major process indicated that approximately twoquads of energy were consumed for distillation in the US in 1976. Energy usage by industry is included: petroleum refineries, 66% chemical (including petrochemical) industry, 29% natural gas liquids processing, 5% Techniques and current practices for conserving distillation energy are reviewed, and guidelines indicating those process conditions which favor the use of each energy conserving technique are enumerated Expressions for payout time for tray and control retrofit options are developed based on energy savings and increased throughput Calculations for industrial colums suggested that both types of retrofits would frequently have short (,6 months) payout times based on either criterion Extractive distillation is also discussed, and criteria enabling the estimation of the energy which may be conserved using this technique are developed Good housekeeping practices and field techniques for checking the energy efficiency of industrial distillations are also discussed

N82-12582# Prototech, Inc., Newton Highlands, Mass ENERGY SAVINGS BY MEANS OF FUEL-CELL ELECTRODES IN ELECTRO-CHEMICAL INDUSTRIES Progress Report, 1 Feb. - 30 Apr. 1981

A Bar-Ilan, Walter Juda, and Brian P Finnigan 31 Jul 1981 26 p refs

(Contract DE-AC02-78ET-25309)

(DE81-030975, DOE/ET-25309/T1, COO-4881-31) Avail

NTIS HC A03/MF A01

Life testing of palladium-loaded and low platinum-loaded anodes on type C supports and with type no 01 current collectors was continued and terminated Additional life-test data are reported for high Pt-loaded and a second low Pt-loaded anode The 6 in x 6 in depth cell was operated at reduced hydrogen back pressures, and the effect of the resulting flooding of the hydrogen chamber upon cell performance was determined Furthermore, two 6 in. x 6 in depth cells were fabricated from the same type platinum support and current collector, but following different preparation procedures. Cell performance was compared at various submergence depths under identical operating conditions

N82-12583# Los Alamos Technical Associates, Inc., N Mex THE SEVERITY OF INSTITUTIONAL BARRIERS AFFECTING ENERGY-FROM-MUNICIPAL-WASTE TECHNOLOGIES

G E Dials, J M Greenwood, L L Lewis, and E M Cole Jun 1981 58 p refs Presented at Inst Barriers Assessment Workshop, Washington, D.C., 19 Feb. 1981. Prepared for Argonne National Lab . III

(Contract W-31-109-eng-38)

ANL/CNSV-TM-79) (DE82-000133.

NTIS

HC A04/MF A01

The results from a workshop during which EMW experts were asked to indicate the importance of these barriers are summarized. The basic results of the workshop participants' scoring of the institutional barriers according to their importance are described. More elaborate analyses conducted on the workshop results are reported A summary of the workshop results and a listing of the most important EMW technology/institutional barrier combinations are included

N82-12587# Argonne National Lab , III Energy and Environmental Systems Div

ASSESSMENT OF THE POTENTIAL OF COAL-FUELED HEAT ENGINES IN TOTAL AND INTEGRATED ENERGY SYS-TEMS

J C Bratis, M L Jain, and T J Marciniak Jun 1981 80 p refs

(Contract W-31-109-eng-38)

(DE82-000169. ANL/FE-81-56) HC A05/MF A01

NTIS Avail

The potential of several prime movers, especially those that use coal, for use in total and integrated energy systems in the residential and commercial sector was investigated. The prime movers considered are diesels, Stirlings, internally and externally fired gas turbines, and steam turbines. Total energy systems based on the prime movers are compared to the conventional system for four communities that represent different ratios of residential to commercial area. The energy savings, environmental effects, and economic benefits are shown it is found that for both scenarios, neither coal nor oil using total energy systems DOE have a definite economic advantage

N82-12589# Department of Energy, Washington, D C Industrial Data Systems Div

NATIONAL INTERIM ENERGY-CONSUMPTION SURVEY:

EXPLORING THE VARIABILITY IN ENERGY CONSUMP-

Robert Latta, Thomas H. Woteki, Lynda Carlson, Wendel Thompson, and Kenneth Vagts Jul 1981 70 p refs DOE/EIA-0272) (DE81-029910. HC A04/MF A01

The variation in total energy consumption and consumption by end use are described. The report concentrates on regression models for describing the variability in natural gas and electricity consumption for households living in single family detached houses. Sample data and the subsets used in the analyses are described A theoretical model for describing a household's energy consumption is presented. Graphical summaries of the data which serve to explain the specific models fit to the data are also presented The empirical models fit to the data, and the method of fitting, are discussed. Results, speculation on interpretation of the model coefficients, and potential uses of the model are summarized . DOE

N82-12593# Rocket Research Corp., Redmond, Wash UTILIZATION OF WASTE HEAT FROM MAJOR TRANS-FORMER SUBSTATIONS. VOLUME 1: GENERIC STUDY Final Report

N T Christensen Aug 1981 190 p refs Sponsored by Electric Power Research Inst 2 Vol

(EPRI Proj 1274-1)

(DE81-904212, EPRI-EM-1968-Vol-1) Avail NTIS

HC A09/MF A01

Large substation transformers reject substantial thermal energy. Since these units are usually close-coupled to facilities requiring low-temperature thermal energy for space conditioning, the ability to recover and efficiently utilize this energy is of significant interest. The intent of this project was to analytically evaluate the technical and economic potential of transformer waste heat recovery and utilization and verify the analysis with subscale testing. A general system was designed and optimized for the recovery of transformer waste heat. Simplified analytical techniques were developed to assist utilities in both preliminary analysis and detail design analysis of specific systems, including system economics Critical component performance parameters were identified for the preparation of detailed specifications Criteria was established for the specific application of such systems through system economics. A national mail survey was conducted to determine the quantity and usability of transformer waste, heat in the United States DOE

N82-12594# Rocket Research Corp., Redmond, Wash UTILIZATION OF WASTE HEAT FROM MAJOR TRANS-FORMER SUBSTATIONS. VOLUME 2: SITE-SPECIFIC STUDY Final Report

N T Christensen Aug 1981 93 p Sponsored by Electric Power Research Inst 2 Vol

(EPRI Proj 1274-1)

(DE81-904236, EPRI-EM-1968-Vol-2) NTIS Avail

HC A05/MF A01

The applicability of transformer waste heat utilization was examined by analyzing a site-specific application. The site is located in Seattle, Washington, the energy source is the Broad Street Substation and the energy user is the Pacific Science Center A description of the system is presented in Section I A preliminary heat source/heat service analysis is given in Section II Transformer waste heat availability and system heat demand. the thermal performance and hydraulic analysis, overall system efficiency, operation flexibility, major component selection, and the thermal storage system are discussed. The substation site, the transmission system, and the retrofit of the Pacific Science Center are described System cost details and a cash flow projection are given

N82-12597# Commission of the European Communities. Luxembourg

APPLICATION OF DIFFERENT KFA-MODELS IN THE FRAMEWORK OF THE ENERGY RESEARCH PROGRAMME OF THE EUROPEAN COMMUNITIES Final Report 1980 98 p refs

(EUR-6758-EN) Avail NTIS HC A05/MF A01

Four West German energy models are presented. (1) an energy policy to decrease dependence on oil and gas imports. (2) fuel parameters of various nuclear power plant systems. (3) investments in environmental protection inthe energy sector

and their effects on the gross national product, and (4) the use of FORTRAN in modular dynamic simulation

N82-12604# Mid-American Solar Energy Complex, Minneapolis,

WOOD RESOURCES AND UTILIZATION PATTERNS IN THE NORTH CENTRAL REGION AND ENERGY NEEDS FOR THE MANUFACTURE OF WOOD PRODUCTS

Steven A Sinclair Mar 1981 37 p refs (Contract DE-AC02-79-CS-30150)

(DE81-030356, MASEC/R-81-005)

NTIS Avail

NTIS

HC A03/MF A01

The resources of the region are discussed on a state-by-state basis. The discussion of standing timber growth and removal is in terms of commercial growing stock, however, the total forest biomass may be estimated by simply adding the potential logging residue to the growing stock figure. The energy needs of various wood and paper products, plants, standard industrial classification codes 24 and 26, are highlighted. In addition, the ability of various wood manufacturing facilities to generate their energy needs from wood residues and by-products is explored

N82-12613# Systems Technology Corp , Xenia, Ohio CONVERSION OF MUNICIPAL SOLID WASTE TO ENERGY, JACKSONVILLE, FLORIDA, PHASE 1

Jul 1981 237 p refs

(Contract DE-AC01-79CS-0231)

DOE/CS-20231/1) (DE82-000808) Avail

HC A11/MF A01

The development of new technology and to foster the commercialization of innovative concepts for energy recovery from municipal solid waste (MSW) was studied A program to implement the Scientific energy engineering auger combustion system was evaluated The commercial version of the system, with a capacity of 350 TPD, was developed. The evaluation of applying resource recovery involved the determination of (1) the amount and characteristics of solid waste, (2) the location and requirement of candidate energy customers and materials markets, (3) the applicable incineration/heat recovery and resource recovery technologies, and (4) the institutional, legal, and environmental requirements for constructing a facility. An implementation plan is developed to define the specific steps required to employ a waste to energy technology

N82-12621# Gersham, Brickner and Bratton, Inc., Washington,

WASTE-TO-ENERGY SYSTEMS INSTITUTIONAL BARRIERS ASSESSMENT WORKSHOP Jun 1981 57 p Workshop Held in Washington, D.C., 19 Feb.

1981 Prepared for Argonne National Lab, III

(Contract W-31-109-eng-38)

(DE82-000098. ANL/CNSV-TM-78)

HC A04/MF A01

Nontechnical institutional barriers affecting implementation of the waste to energy technology, priorization, of identifed barriers, and utilization of information and data to formulate an institutional research plarr, were identified. The following important results are recorded for commercialized and noncommercialized combustor, siting existing laws, multipurisdictional ination, permiles and regulations, and the lack of data on environmental impacts DOE

N82-12635# Gilbert Associates, Inc., Reading, Pa MODULAR"HYDRO DAM APPROACH TO THE ECONOMIC DEVELOPMENT OF ULTRA LOW-HEAD HYDROPOWER
K R Broome 1981 19 p Presented at the Hydropower Conf , Washington, D.C., 22 Jun 1981 (Contract DE-AC07-76ID-01570)

(DE81-027817, CONF-8106137) NTIS

HC A02/MF A01

The potential for developing economical new ultra low head sites using an innovative concept known as the modular hydro dam (MHD) were explored. This concept, combines the benefits of shop fabrication and installation of equipment in truck transportable, waterproof power modules, with prefabricated gate sections that can be located between the power modules. The technical, economic, environmental, and institutional feasibility of the MHD concept are examined Capital and operating costs are estimated it is concluded that the potential for power generation at ultralow head sites justifies the development of DOE the MHD concept

N82-12636# Edgerton, Germeshausen and Grier, Inc., Idaho Falls, Idaho

DOE SMALL-HYDROPOWER DEMONSTRATION PRO-GRAM

B N Rinehart and L E Felton Jun 1981 15 p refs Presented at Waterpower 1981 Conf., Washington, D.C., 22 Jun 1981 (Contract DE-AC07-76ID-01570)

CONF-8106137-2) (DE81-027819; HC A02/MF A01

Hydroelectric power demonstration projects were developed at small dams. The project methods and results are presented

N82-12637# Brookhaven National Lab , Upton, N Y Div of Energy and Economic Analysis

MODELLING ENERGY-ECONOMIC INTERACTIONS IN DEVELOPING COUNTRIES: A LINEAR-PROGRAMMING APPROACH

Peter Meier and Vinod Mubayi 1981 51 p refs Presented at the 9th Intern Conf. on Operational Res , Hâmburg, 23 Jul. 1981, sponsored by International Federation of Operations Research Societies

(Contract DE-AC02-76CH-00016)

(DE81-026048, BNL-29747, CONF-810726-2) Avail NTIS HC A04/MF A01

An energy economic assessment model for application to energy assessments in developing countries is described. A simple comprehensive treatment of the energy sector is emphasized The input output model is directly incorporated in the Energy system LP The major supply sectors, as well as the major energy using industries, are modelled as capacity expansion problems, in which explicit distinction is made between capital stock and energy flows. For most developing countries the notion of energy supply curves is far fetched, since energy prices are set by planning authority, not established by market clearing aquilibrium

N82-12641# Audi NSU Auto Union A.G., Neckarsulm (West "Entwicklung Neckarsulm Germany)

FUEL SAVINGS IN HOT WATER HEATING PLANTS BY APPLICATION OF HEAT PUMPS OPERATED WITH NATURAL GAS (NATURAL GAS HEAT PUMP). PROJECT: GAS ENGINE Final Report

Klaus Wissler Bonn Bundesministerium füer Forschung und Technologie Dec 1980 61 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-80-125, ISSN-0340-7608) Avail. NTIS HC A04/MF A01, Fachinformationszentrum, Karlsruhe, West

Germany DM 11,60

Energy consumption in residential heating using a heat pump driven by an internal combustion engine is discussed. A natural gas rotary engine was developed as a drive unit for a heat pump with 120 to 150 kW heating capacity. The engine was derived from an automotive prototype engine, it had an output of 50 kW at 6000 rpm. The efficiency was improved by an increased compression ratio and a rotor recess suitable for natural gas operation. The engine used specially developed spark plugs and high performance lubrication oil To obtain longevity, the trochoid surface and the side housing surface were coated with a plasma spray wear coating, ceramic apex seals were used and the accessories were redesigned Author (ESA)

N82-12650 California Univ , Los Angeles A COMPUTER SIMULATION MODELING STUDY TO PREDICT AIR QUALITY IMPACTS FROM A 500 MW COAL-FIRED POWER PLANT Ph.D. Thesis Gary Van Jandegian 1981 255 p

Avail Univ Microfilms Order No 8120979

A computer simulation modeling study was conducted to predict sulfur dioxide ambient air quality impacts resulting from the operation of a 500 megawatt coal-fired power plant expansion in the Trombay area of Bombay, India The AQUAL, a multiple source Gaussian plume dispersion model employs diffusion coefficients and plume use equations and predicts maximum and average 3 hour and 24 hour ground level pollutant concentrations for up to 250 receptor points within 20 kilometers of a power plant stack(s). Results of the modeling exercises are used to recommend proper SO2 controls such as flue gas

desulfurization, fuel switching to low sulfur oil and natural gas, Dissert Abstr

N82-12657*# Mechanical Technology, Inc., Latham, N. Y. ELECTRIC AND HYBRID VEHICLES ENVIRONMENTAL CONTROL SUBSYSTEM STUDY Final Technical Report 15 May 1981 288 p refs Sponsored in part by DOE Prepared for JPL

(Contract JPL-955682)

(NASA-CR-164995, JPL-9950-570, MTI-81TR36) Avail NTIS HC A13/MF A01 CSCL 13B

An environmental control subsystem (ECS) in the passenger compartment of electric and hybrid vehicles is studied Various methods of obtaining the desired temperature control for the battery pack is also studied. The functional requirements of ECS equipment is defined. Following categorization by methodology, technology availability and risk, all viable ECS concepts are evaluated Each is assessed independently for benefits versus risk, as well as for its feasibility to short, intermediate and long term product development. Selection of the preferred concept is made against these requirements, as well as the study's major goal of providing safe, highly efficient and thermally confortable **ECS** equipment

N82-12658* TRW, Inc., McLean, Va Energy Systems Planning

ELECTRIC AND HYBRID VEHICLE ENVIRONMENTAL

CONTROL SUBSYSTEM STUDY Final Report
Kenneth L. Heitner 4 Dec. 1980 198 p refs Sponsored in part by DOE Prepared for JPL (Contract JPL-955683)

(NASA-CR-164996, JPL-9950-569; Rept-97649-E005-UX-02) Avail NTIS HC A09/MF A01 CSCL 13B

An environmental control subsystem (ECS) in electric and hybrid vehicles is studied. A combination of a combustion heater and gasoline engine (Otto cycle) driven vapor compression air conditioner is selected. The combustion heater, the small gasoline engine, and the vapor compression air conditioner are commercially available. These technologies have good cost and performance characteristics. The cost for this ECS is relatively close to the cost of current ECS's Its effect on the vehicle's propulsion battery is minimal and the ECS size and weight do not have significant impact on the vehicle's range

N82-12660# Aerospace Corp., Germantown, Md ENERGY TECHNOLOGIES AND THE ENVIRONMENT. **ENVIRONMENTAL INFORMATION HANDBOOK**

Jun 1981 515 p refs (Contract DE-AT03-76EV-74010)

(DE81-029809, DOE/EP-0026)

HC A22/MF A01

Information on the environmental consequences of energy technologies that will be in use during the next 20 years are reviewed. Information on environmental issues, control technologies, and energy production and conservation processes is discussed References are given for the statements, data, and conclusions Environmental aspects of energy technologies and references that can be relied upon through changing policies

N82-12661# Bioassay Systems Corp., Woburn, Mass DEVELOPMENT OF TESTING PROCEDURES AND BIBLIO-GRAPHIC INFORMATION RELEVANT TO THE TESTING OF SOLID WASTES RESULTING FROM SYNTHETIC FUELS PRODUCTION Progress Report, 1 Apr. - 30 Jun. 1981 J M Smith and D. M Hanson Jun 1981 17 p refs

(Contract DE-AC22-80PC-30098)

and changing world energy prices are presented.

(DE81-030822. DOE/PC-30098/T2) HC A02/MF A01

NTIS

NTIS

DOF

The data tables outlining which bioassay procedures were applied to various synfuel wastes were finalized Justification for each of the assays (Health and Ecological Effects) proposed in the test battery were written in addition, the extraction and assay schedules were developed for Task 3 DOE

N82-12667# Energy and Environmental Analysis, Inc., Arlington,

IMPACT OF FUEL-ECONOMY SHORTFALL: TRENDS IN TECHNOLOGY-WEIGHTED EPA VERSUS ON-ROAD MPG. PERIODIC ANALYSIS MEMORANDUM NO. 1

1 Apr 1981 23 p refs (Contract DE-AC01-79PE-70032) (DE81-030841, DOE/PE-70032/T1) NTIS HC A02/MF A01

The fuel consumption impacts of revised estimates of the shortfall between the EPA-measured and on-road fuel economy of light-duty vehicles (passenger cars and light-duty trucks less than 8500 lbs GVW) are examined. The analysis uses the DOE Highway Fuel Consumption model to project fuel demand. The technologies and technology-specific shortfall relations are examined. The procedure used to develop aggregate technologyweighted fuel economy shortfall relations for the Highway Fuel Consumption model is outlined. The fuel demand impacts of alternative assumptions regarding technology-specific shortfall are

N82-12671# Aerospace Corp., Germantown, Md TECHNOLOGY CHARACTERIZATIONS: ENVIRONMENTAL INFORMATION HANDBOOK, SECOND EDITION Jun 1981 340 p refs

(Contracts DE-AT03-76EV-74010, DE-AC01-81EV-10450) (DE81-029993. DOE/EP-0028) HC A15/MF A01

Environmental characterization information for a range of energy supply systems is presented. Environmental residuals and physical resource requirements are the principal information provided. The specific energy technologies included are nuclear, petroleum, natural gas, synthetic fuels, coal, solar, geothermal, and hydroelectric Each technology is characterized in terms of the resources required, costs, residuals released, energy products, and occupational safety and health data. The information is based on a facility of particular size and design, with the data presented on the basis of annual quantities or total facility lifetime quantities (e.g., construction materials), as appropriate. In addition, the data are normalized to 1 trillion Btu energy output to facilitate cross technology comparison and use of the data in computerized data bases

N82-12673# Bioassay Systems Corp., Woburn, Mass DEVELOPMENT OF TESTING PROCEDURES AND BIBLIO-**GRAPHIC INFORMATION RELEVANT TO THE TESTING OF** SOLID WASTES RESULTING FROM SYNTHETIC-FUELS PRODUCTION Technical Progress Report, 30 Dec. 1980 -31 Mar. 1981

James M Smith and Douglas M Hanson Mar 1981 25 p refs

(Contract DE-AC22-80PC-30098)

DOE/PC-30098/T1) (DE81-030671. NTIS Avail. HC A02/MF A01

A bibliography containing over 80 references on material pertinent to the biological testing of snyfuel products is presented along with a compedium of information on bioassays performed on all synfuel materials within the last ten years. A sample preparation procedure useful in extracting substances for bioassay testing and a bioassay test battery suitable for testing synfuel solid wastes are described

N82-12674# Oak Ridge National Lab , Tenn Chemical Technology Div KINETICS OF WET OXIDATION OF BIOLOGICAL SLUDGES FROM COAL-CONVERSION WASTEWATER TREATMENT R K Helling, M K Strobel, and R J Torres Sep 1981 55 p. refs (Contract W-7405-eng-26) NTIS

ORNL/MIT-332) (DF82-000525) HC A04/MF A01

Combustible organics in aqueous solutions or suspensions, which are characteristic of waste aqueous solutions or suspensions, which are characteristics of waste treatment effluent from coal liquefaction, may be treatable by wet oxidation. The wet oxidation of model compounds (phenol in water or phenol in municipal waste sludge) in a batch autoclave reactor was found to proceed rapidly to 99% conversion in less than 15 min for temperatures between 185 and 2300C, oxygen pressures between 2000 and 1300 psig, and initial phenol concentrations of 25, 10, and 50 g/L. The reaction occurs in three phases a slow induction period, a fast first-order reaction with a low activation. energy of 4 9 kcal/gmol, followed by a slow first-order reaction During the reaction a variety of colored intermediates (catechol, succinic acid, hydroquinine) form it is postulated that the fast

portion of the reaction sequence follows free-radical mechan-

N82-12675# Zawadzki (Edward A.) Ltd., McMurray, Pa PRELIMINARY STUDY: USE OF LOW-SULFUR COAL AND COAL CLEANING IN CONTROL OF ACID RAIN May 1981 38 p

(Contract DE-AC21-80MC-14784)

(DE81-028930. DOE/MC-14784/T1) Avail NTIS HC A03/MF A01

The acid rain problem and the feasibility of various control techniques are addressed. Two strategies that are proposed for control of acid rain, are considered, (1) use of naturally occurring low-sulfur coal, and (2) cleaning of raw coal in preparation plants prior to firing. The distribution and ownership of the US coal reserves are discussed with emphasis on the reserves having low sulfur content. Some of the basic constraints on the availability and use of low-sulfur coals by utilities are enumerated A preliminary estimate of the sulfur reduction potential of US coals achievable by coal preparation is presented. Also included are a brief analysis of coal cleaning costs and the effects of coal cleaning on other aspects of acid rain control

N82-12680# New Mexico State Univ. Las Cruces ASSESSMENT OF WATER SUPPLY CONTAMINATION DUE TO UNDERGROUND COAL GASIFICATION

Thomas M Niemczyk and Edward A Walters Dec 1980 105 p refs Prepared in cooperation with New Mexico Univ, Albuquerque.

(PB81-209215, WRRI-128, W81-03269,

OWRT-B-061-NMEX(1)) Avail NTIS HC A06/MF A01 CSCL

The potential for pollution by metal ions of groundwater as a consequence of proposed underground coal gasification was assessed focusing on subbituminous coal of the San Juan Basin in northwestern New Mexico Baseline results for major and trace metal analysis of groundwater and minerals, anionic analyses, and trace organic analyses of groundwater are presented GRA

N82-12765# Oak Ridge National Lab., Tenn OVERVIEW OF THE BIOMEDICAL AND ENVIRONMENTAL PROGRAMS AT THE OAK RIDGE NATIONAL LABORA-TORY

H A Pfuderer, comp and J B Moody, comp Jul 1981 62 p.f

(Contract W-7405-eng-26)

(DE81-027864, ORNL-5806) Avail NTIS HC A04/MF A01

Biomedical and environmental research, to provide information on environmental, health, and safety considerations, which can be utilized in the formulation and implementation of energy technology decisions is discussed. Information for the understanding of short term and long term consequences of processes in new energy technologies were researched. The mechanisms responsible for biological and ecological damage caused by substances associated with energy production and repair DOE mechanisms are investigated

N82-12766# Texas A&M Univ. College Station Dept of Chemistry, Medical Microbiology and Immunology IDENTIFICATION AND TOXICITY OF FRACTIONATED-SHALE-OIL COMPONENTS

K Wittnebel, D. C Shelly, C-N Ho, I M Warner, and J M Quarles 1981 17 p refs

(Contract DE-AS05-80EV-10404)

(DE81-028460. DOE/EV-10404/T1) NTIS

HC A02/MF A01

A procedure for the separation and identification of polynuclear aromatic hydrocarbons (PNAs) is presented. This procedure comprises two steps. First, the shale oil is separated into fractions according to ring size on a Chromosorb LC-9 normal phase column. Then each of these fractions are separated into individual components and identified using an analytical reversed-phase Ultrasphere ODS 5 micrometer column. In addition, toxicity studies are carried out on each fraction obtained from the amine column to indicate which class of PNAs warrants special attention and analysis. The results of this approach are reported

N82-12842# Brookhaven National Lab , Upton, N Y PROJECT IMPACT ANALYSIS AS AN OPTIMAL CONTROL

PROBLEM

G. Anandalıngam 1981 43 p refs Presented at the Joint Meeting of the Inst of Management Sci and Operations Res Soc. Toronto, 3-6 May 1981

(Contract DE-AC02-76CH-00016)

(DE81-028465, BNL-29881, CONF-810542-5) Avail NTIS HC A03/MF A01

The effects of a major investment project on a multi-sector less developed economy are analyzed. Single investment projects with external effects reaching across the entire economy are frequently encountered in developing countries. The Mahaweli Ganga development project in Sri Lanka, a multi-dam irrigation and hydroelectric power project is evaluated. The Mahawell project calls for an annual investment level, in 1970 prices, of \$150 million over a period of six years, which is 50 percent of the annual expenditure of the government. The project requires a large fraction of total investment over a medium term planning period and materially alters the existing supply and demand for major goods and services. The project is sufficiently large that its effect is economy-wide. The model used is a dynamic input-output optimizing model having the mathematical structure of an optimal control problem

N82-12924# Oak Ridge National Lab , Tenn LOW-LEVEL RADIOACTIVE WASTE: AN INTRODUCTORY **OVERVIEW**

H W Godbee and A H Kibbey 1981 9 p Presented at the ASME Short Course on Radioactive Waste Management for Nucl Power Reactors and Other Facilities, Alexandria, Va., 13-17 July,

(Contract W-7405-eng-26)

(DE81-026334. CONF-810733-1)

NTIS Avail.

HC A02/MF A01

In 1980, the accumulated volume of buried low-level waste (LLW) in the United States amounted to over 92,000 cu m Of this, 49,700 cu m was attributed to the US commercial fuel cycle, 36,400 cu m to institutional and industrial, and 76,300 cu m to government activities. In addition, there was another 6500 cu m of LLW sent to commercial burial grounds from government agencies or other licensed activities (e.g., fabrication of fuel for foreign reactors) If no more land is licensed for commercial burial, Barnwell with its limited waste acceptance will be the only site still operating in the year 2000. Of the DOE sites, only NTS and Hanford will have ample land. All the other principal DOE sites except LASL will be exhausted and this site will have about 7 of usable land left

NB2-13014# Systems Control, Inc., West Palm Beach, Fla Technology Industries Div

ANALYSIS OF INTEGRATED FUEL-EFFICIENT, LOW-NOISE PROCEDURES IN TERMINAL-AREA OPERATIONS

J B McKinley Jan 1981 125 p refs (Contract DE-ACO1-80CS-50141)

(DE81-029833: DOE/CS-50141/T1) NTIS

HC A06/MF A01

The specific aviation energy conservation issues, terminal area fuel conservation and airport noise level relationships, are investigated. The potential fuel savings and noise level reduction in the Los Angeles International (LAX) terminal area between 1980 and 1990 attributable to compliance with the noise requirements of FAR Part 36 were quantified These savings are due to the retiring, retrofiting and re-engining of older narrow-body aircraft (DC-8, B707, etc.) and the growth of wide body aircraft operations (DC-10, B747, B767, etc.) Current noise abatement procedures that could be relaxed without adversely impacting current (1980) noise levels, and at the same time conserving additional fuel. Two FAA computer models were used The Integrated Noise Model (INM) Version 27, was used for noise analysis, and INKMOD, a preliminary fuel burn model, for the fuel analysis. The results of this detailed analysis revealed that due to the changing aircraft mix at LAX to include more wide body aircraft and fewer narrow body aircraft operations. airport noise level will decrease by 8.5 and 9.2 square miles on the 75 Ldn contour for 1985 and 1990, respectively, from the 1980 baseline

N82-13018# Corporate-Tech Planning, Inc., Waltham, Mass AUGMENTATION OF RESEARCH AND ANALYSIS CAP-ABILITIES FOR TIMELY SUPPORT OF AUTOMOTIVE FUEL ECONOMY ACTIVITIES. VOLUME 1: SUMMARY Final Report, Dec. 1977 - Nov. 1979

Theodore Taylor, Jr Dec 1980 43 p 3 Vol (Contract DOT-HS-7-01789) (PB81-219479. DOT-HS-805903) Avail HC A03/MF A01, also available in set of 3 reports HC E15 as PB81-219461 CSCL 13F

A series of research tasks were undertaken to assess the potential fuel economy improvements for passenger cars and light trucks during the 1980 to 1985 time frame, and later to 1990 Specific subject areas of investigation include, spark ignition engine improvements, fuel economy potential of aternate engines; reductions in tire rolling resistance, aerodynamic drag, and engine friction (through improved lubricants), weight reduction of domestic and certain import passenger vehicles, including a teardown of a Chrysler - Dodge Omni for an analysis of materials and weight and a technology assessment of carbon composites as a future substitute materials. Manufacturing and consumer costs for the fuel economy improvement areas identified. identification of unregulated diesel emission problem areas in need of research and a determination of the cost benefits of petroleum conservation by means other than fuel economy standards are included.

N82-13019# Corporate-Tech Planning, Inc., Waltham, Mass AUGMENTATION OF RESEARCH AND ANALYSIS CAP-ABILITIES FOR TIMELY SUPPORT OF AUTOMOTIVE FUEL ECONOMY ACTIVITIES. VOLUME 2: APPENDICES A THROUGH C Final Report
Theodore Taylor, Jr Dec 1980 220 p 3 Vol
(Contract DOT-HS-7-01789)

(PB81-219487. DOT-HS-805904) NTIS Avail HC A10/MF A01, also available in set of 3 reports HC E15 as PB81-219461 CSCL 13F

The potential fuel economy improvements for passenger cars and light trucks during the 1980 to 1985 time frame, and later to 1990 were assessed Automotive technology, product planning, manufacturing costs and transportation energy economics were addressed. Tire rolling resistance, aerodynamic drag, and improved lubrications are covered along with manufacturing and consumer costs, unregulated diesel emission research, and alternate means of petroleum conservation

N82-13020# Corporate-Tech Planning, Inc., Waltham, Mass. AUGMENTATION OF RESEARCH AND ANALYSIS CAP-ABILITIES FOR TIMELY SUPPORT OF AUTOMOTIVE FUEL ECONOMY ACTIVITIES. VOLUME 3: APPENDIX D Final Report, Dec. 1977 - Nov. 1979 Theodore Taylor, Jr Dec 1980 204 p refs 3 Vol

(Contract DOT-HS-7-01789)

(PB81-219495;

DOT-HS-805905) NTIS Avail HC_A10/MF A01, also available in set of 3 reports HC E15 as PB81-219461 CSCL 13F

Alternative means of petroleum conservation were surveyed and a preliminary estimate of their possible costs and benefits was derived The potential for petroleum conservation was analyzed for each sector of the economy. These include electric utilities, residential and commercial buildings, selected industries, and nonautomotive industries GRA

N82-13191# Ames Lab, lowa POWER-PLANT FLY-ASH UTILIZATION: A CHEMICAL-PROCESSING PERSPECTIVE

G Burnet and M J Murtha 1981 12 p refs Presented at the Portland Cement Assoc Conf on Manufacturing Process. Albuquerque, N. Mex., 14-15 Jan. 1981. Prepared jointly with lowa State Univ of Science and Technology (Contract W-7504-eng-82)

(DE81-025452, IS-M-321, CONF-810151-1) Avail NTIS HC A02/MF A01

Solid wastes from coal combustion, including fly ash, are classified as hazardous under present EPA definitions Research on fly ash utilization including extraction of metals and uses for process residues is discussed. One process investigated uses a lime-soda sinter method to form soluble aluminate compounds from mixtures of fly ash, limestone, and soda ash. The aluminates are extracted, treated to remove silicates, and precipitated the precipitate is calcined to metallurgical grade alumina. The extract residue shows promise as a raw material for the production of Portland cement Process economics, effects of alumina and silica contents of the fly ash, sintering temperatures and time, and sales credits for by-products are discussed

N82-13192# AeroChem Research Labs, Inc. Princeton, N J RATE COEFFICIENTS OF COMBUSTION/FUEL CONVER-SION REACTIONS BY HIGH-TEMPERATURE PHOTOCHEM-ISTRY Progress Report, 1 Sep. 1980 - 30 Jun. 1981 William Felder Jul 1981 7 p refs

(Contract DE-AC02-77ER-04169)

(DE81-027965, DOE/ER-04169/T1, AeroChem-TN-219,

COO-4169-6) Avail NTIS HC A02/MF A01

Reliable kinetic data on isolated elemetary combustion reactions spanning a broad temperature range are required for modeling and scaling studies and reducing the pollutant formation from fossil-fuel burning devices A new technique, High Temperature Photochemistry (HTP) combines the technology of the High-Temperature Fast-Flow Reactors developed to study kinetics of metal atom/oxide reactions with the flash photolysis technique Aspect of a partially complete HTP study on chemical reactions CH3 oxidation by O2 and O atoms are presented

N82-13243*# Engineering Societies Commission on Energy, Inc., Washington, D. C. BARRIERS TO THE UTILIZATION OF SYNTHETIC FUELS FOR TRANSPORTATION Final Report

Harry W Parker and Matthew J Reilly Oct 1981 25 p (NASA Order C-57307-D. Contract DE-AI01-81CS-50006) (NASA-CR-165517, DOE/NASA-7307/1) HC A02/MF A01 CSCL 21D

The principal types of engines for transportation uses are reviewed and the specifications for conventional fuels are compared with specifications for synthetic fuels. Synfuel processes nearing the commercialization phase are reviewed. The barriers to using synfuels can be classified into four groups technical. such as the uncertainty that a new engine design can satisfy the desired performance criteria, environmental, such as the risk that the engine emissions cannot meet the applicable environmental standards, economic, including the cost of using a synfuel relative to conventional transportation fuels, and market, involving market penetration by offering new engines, establishing new distribution systems and/or changing user expectations

N82-13255# Comptroller General of the United States.
Washington, D C

NATURAL GAS PLAN NEEDED TO PROVIDE GREATER PROTECTION FOR HIGH-PRIORITY AND CRITICAL USES Report to the Congress

23 Mar 1981 57 p

(PB81-228488, EMD-81-27) Avail NTIS HC A04/MF A01 CSCL 21D

Natural gas legislation and programs implemented over the past decade and currently ongoing at the Federal, state, and local levels are discussed Some of the shortcomings, inconsistencies, and incompatibilities between legislative intent and program implementation at the various levels are highlighted

N82-13256# Bechtel Power Corp., San Francisco, Calif. ENVIRONMENTAL AND ECONOMIC COMPARISON OF **ADVANCED PROCESSES FOR CONVERSION OF COAL AND** BIOMASS INTO CLEAN ENERGY Final Report, Sep. 1977 - Dec. 1978

R A Stenzel, B T Kown, M C Weekes, J D Ruby, B R Gilbert, C M Harper, Y G Yim, and R T Milligan Aug 1981 402 p refs

(Contract EPA-68-02-2616)

(PB81-234239. EPA-600/7-81-133) NTIS

HC A16/MF A01 CSCL 21D

Biomass and coal conversion into clean energy is compared on an economic and environmental basis in three regional scenarios (1) electric power from direct combustion of wood versus conventional coal combustion, (2) synthetic pipeline gas from anaerobic digestion of wheat straw and manure versus high-Btu gasification of coal (HYGAS), and (3) synthetic fuel oil from wood liquefaction versus coal liquefaction (H-Coal) Conceptual commercial-scale plants are described Capital and operating costs are presented for each of the six plants, and the biomass versus coal economics are compared General environmental impacts of biomass and coal resource collection are assessed and compared in the scenario contexts

N82-13263# California Univ , Livermore Lawrence Livermore Lab

ULTIMATE IN BUILDING ENERGY ANALYSIS: DOE-2 AND BLAST

B D Hunn 1981 33 p refs Presented at the Symp Energy and Big Building Design, Philadelphia, 25-26 May 1981 Submitted for publication

(Contract W-7405-eng-36)

(DE81-028703, LA-UR-81-2288, CONF-8105107-1) Avail NTIS HC A03/MF A01

The DOE-2 and BLAST computer programs are investigated in terms of their usefulness in building energy analysis DOE-2 and BLAST are generally classed as high-level, computer-dynamic methods that are based on hour-by-hour computation. The characteristics of DOE-2 and BLAST are discussed with emphasis on their solar simulation features, and their capabilities are contrasted and related Typical applications of the programs to the retrofit of existing buildings and the design of new buildings. are presented. The passive solar retrofit of an office building, the use of DOE-2 as a predesign analysis tool, and the use of BLAST in a research and development application are all described Future directions in research and development needs for high level building energy analysis tools and the progress being made toward increased use of these tools are discussed

N82-13267# Connecticut Dept of Transportation, Wethersfield CONSTRUCTION OF A RECYCLED PORTLAND CEMENT CONCRETE PAVEMENT Construction Report, Oct. 1979 -May 1980

Keith R Lane Sep 1980 43 p refs

(HPR Proj 646)

(PB81-233553, FHWA/CT-80/12, Rept-646-1-80-12) Avail NTIS HC A03/MF A01 CSCL 13B

Connecticut's first experience with Portland cement concrete recycling is described. The test location was on 1-84 in Waterbury, a major expressway which required extensive realignment and widening. The primary concern was to obtain the technical expertise to design and place a recycled pavement Secondary factors also investigated were the analysis of environmental, economic and energy factors relative to the option of recycling or new construction of a portland cement concrete pavement

N82-13392# Foster-Miller Associates, Inc., Waltham, Mass DESIGN AND DEVELOPMENT OF A RECIPROCATING LOW-TEMPERATURE FREON EXPANDER

S. J. Hynek, A. C. Harvey, R. L. Demler, D. H. Walker, and H. H. Fuller. 1981. 17 p. Presented at the Inter-Soc Energy Conversion Eng. Conf., Atlanta, 9-14 Aug. 1981. (Contract W-7405-eng-26)

(DE81-028609, CONF-810812-34)

Avail

NTIS

HC A02/MF A01

The design and development of a 20-ton refrigeration system to be powered by 140 F waste hot water is described. The system consists of a Rankine cycle driving a reverse-Rankine cycle, integrated in that they share a common working fluid, a common condenser, and a common crankcase housing the expander and compressor A reciprocating single-acting counterlow expander provides a combination of high efficiency in the desired capacity range, modularity, and adaptability to existing compressors Because the temperatures and pressures of the Rankine cycle fell within the design envelope of a standard refrigeration compressor, the compressor and expander could be housed within the same crankcase by converting some of the compressor cylinders to expander cylinders by replacing the cylinder heads DOE

N82-13435# Department of Energy, Bartlesville, Okla PERFORMANCE CHARACTERISTICS OF AUTOMOTIVE ENGINES IN THE UNITED STATES, THIRD SERIES: 1977 CHRYSLER 318 CID (5.2L), 2V Interim Report

D E Koehler, W F Marshall, and K R. Stamper Jun. 1981 60 p

(PB81-233025, DOT-TSC-NHTSA-81-6; BETC/OP-79/2; DOT-HS-805814, Rept-13) Avail NTIS HC A04/MF A01 CSCL 21G

Dynamometer tests of a 1977 Chrysler 318 CID engine to determine fuel consumption and emissions (hydrocarbon, carbon monoxide, oxides of nitrogen) at steady state engine operating modes were performed. Engine performance data for estimating emissions and fuel economy for varied engine service and duty were obtained Basic engine characteristic data required as

input for engineering calculations involving ground transportation GRA are provided.

N82-13489# Bureau of Mines, Pittsburgh, Pa Research

SUPPRESSION OF COAL DUST EXPLOSION BY WATER BARRIER IN A CONVEYOR BELT ENTRY

I Liebman and J K Richmond Jun 1981 34 p (PB81-233306, BM-RI-8538) Avail NTIS HC A03/MF A01 CSCL 08L

Experiments on coal dust explosion suppression were conducted in a simulated working mine environment. It was shown that a coal dust explosion can be readily initiated in a conveyor belt entry and the explosion can spread into adjacent entries through opened crosscuts to propagate for long distances even though the adjacent entries are rock ducted. Passive water barriers are effective in suppressing explosions on a beltway. however, barrier efficiency is reduced by opened crosscuts. It is indicated that the beltway barrier should have continuous rows of water filled tubs covering long distances along the entry GRA

N82-13493*# Jet Propulsion Lab. California Inst of Tech. Pasadena

A PRELIMINARY ESTIMATE OF FUTURE COMMUNICA-TIONS TRAFFIC FOR THE ELECTRIC POWER SYSTEM

Roger M Barnett 15 Oct 1981 73 p refs (Contracts NAS7-100, DE-AI01-79ET-29372)

(NASA-CR-165015, JPL-Pub-81-41, DOE/ET-29372/2) Avail

NTIS HC A04/MF A01 CSCL 10B

Diverse new generator technologies using renewable energy, and to improve operational efficiency throughout the existing electric power systems are presented. A description of a model utility and the information transfer requirements imposed by incorporation of dispersed storage and generation technologies and implementation of more extensive energy management are estimated. An example of possible traffic for an assumed system, and an approach that can be applied to other systems, control configurations, or dispersed storage and generation penetrations is provided EAK

N82-13512# Applied Physics Lab , Johns Hopkins Univ , Laurel ,

ALTERNATE HYBRID POWER SOURCES FOR REMOTE SITE APPLICATIONS Final Report, Feb. 1980 - Feb. 1981

W Richard Powell, Robert J Taylor, J L Baron, E E Mengel, and J C Ray Feb 1981 229 p refs (Contracts N00024-78-C-5384, MIPR-Z-70099)

(AD-A099471, USCG-D-06-81) . Avail

HC A11/MF A01 CSCL 10/2

Operation of diesel electric generators at remote Coast Guard sites are discussed. The electric power required by modules and subsystems in a modern lighthouse was investigated. The availability of wind power, solar energy, and other renewable energy sources in the local environment at remote lighthouses and other sites is discussed. A life cycle cost analysis methodology applicable to continuously variable life expectancies is developed and illustrated. Diesel generator costs, including service visit expenses, are modeled Other factors relating to the analysis of alternate energy systems as supplements to diesel electric generators at remote sites are discussed

N82-13522# Department of Energy, Oak Ridge, Tenn. Technical Information Center

INFORMATION RESOURCES IN THE USA ON NEW AND RENEWABLE ENERGY, A DESCRIPTION AND RECTORY

1 Jun 1981 81 p Presented at the United Nations Conf. Nairobi, Kenya, Aug 1981

(DE81-028867; CONF-810802-2) Avail: **NTIS** HC A05/MF A01

The production dissemination, and availability of US scientific and technical information about new and renewable energy resources, the policy framework within which the technologies are developed, and the roles of public and private sectors are reported. A directory of sources of additional information, printed material, computerized data bases, institutional services, personal contacts, about the use of new and renewable energy is included

N82-13523# Oak Ridge National Lab , Tenn Energy Div ANNUAL CYCLE ENERGY SYSTEM EXPERIMENTAL PERFORMANCE AND NATIONAL APPLICABILITY

Van D Baxter 1981 6 p refs Presented at the IECEC Conf , Atlanta, 9 Aug 1981 Submitted for publication

(Contract W-7405-eng-26)

DE81-028570. CONF-810812-32) HC A02/MF A01

NTIS

The energy conserving potential of the annual cycle energy system (ACES) was demonstrated. The performance of the ACES was compared with that of two different air to air heat pumps in an identical house, the control house. The ACES achieved nearly all of its theoretical performance predictions and verified its design criteria. The system delivered residential heating and cooling services while consuming only 57 percent as much electricity as the best conventional alternative tested Computer studies show the ACES to be applicable to all US climatic zones except those with very low heating needs

N82-13525# South Carolina Energy Research Inst., Columbia RESIDUAL-ENERGY-APPLICATIONS PROGRAM ENVIRON-MENTAL ANALYSIS REPORT

Torgny J Vigerstad and F J McCrosson Oct 1980 48 p refs

(Contract DE-AC09-77ET-12866)

(DF81-027538) DOE/ET-12866/5) NTIS Avail

HC A03/MF A01

Environmental analysis performance support of a facility to test industrial scale waste heat recovery equipment and utilization are documented Topics covered include legal requirements, likely sites, and operating characteristics of equipment to be tested Environmental issues surrounding the use of the P-reactor and Par Pond as sources of heating and cooling water are addressed The Par Pond cooling system is considered for siting of the Energy Applied Systems Tests (EAST) Facility The Par Pond system has the potential to confine all potential environmental impacts of the construction and operation of the EAST Facility within the boundaries of the Savannah River Plant Characteristics of the EAST Facility are described and a general description of Par Pond is given

N82-13535# Pacific Northwest Lab , Richland, Wash TECHNOLOGY ASSESSMENT OF SOLAR ENERGY SYS-TEMS: AVAILABILITY AND IMPACTS OF WOODY BIOMASS UTILIZATION IN THE PACIFIC NORTHWEST W J Hopp, A D Chockie, and K J Allwine Sep 1981 57 p refe

(Contract DE-AC06-76RL-01830)

(DE82-000705, PNL-3933) Avail NTIS HC A04/MF A01 The biomass resource base in the Northwest were estimated Scenarios and a preliminary analysis in the collection and use of forest residues as an energy resource are presented Four issues that may serve to constrain the total amount of wood residues available for use as fuel are reviewed DOE

N82-13536# Oak Ridge National Lab , Tenn Energy Div BUILDING A CONSENSUS ABOUT ENERGY TECHNOLO-GIES

T J Wilbanks Sep 1981 12 p refs

(Contract W-7405-eng-26)

(DE82-000501, ORNL-5784) Avail NTIS HC A02/MF A01 The making and sustaining of major energy policy decisions are considered. The major policy alternatives for making energy decision-making more effective are outlined. The focus is on relatively large decisions about energy technologies. The policy alternatives are characterized as being either focused on technology or on social action. Technology focused options include technology choices and improvements. Social action focused options include information, incentives, legitimacy, and institutional changes But it is clear that they pose several basic philosophical questions, such as whether to base decisions on strong central leadership or on broad consensus formation. And it is clear that the options vary in being best suited for business as usual situations or emergency decision making situations

N82-13539# Midwest Research Inst., Golden, Colo Solar Energy Research Inst

NEW AND RENEWABLE ENERGY IN THE UNITED STATES OF AMERICA

Jun. 1981 115 p. To be presented at the 1981 United Nations

01 ENERGY POLICIES AND ENERGY SYSTEMS ANALYSIS

Conf on New and Renewable Sources of Energy Sponsored in part by the State Dept

(Contracts EG-77-C-01-4042, DE-AC02-77CH-00178) (DE81-030887. DOE/S-00012)

HC A06/MF A01

NTIS

The current technical and economic status of technologies and with and expectations for new and renewable energy sources in the United States are described. The roles of the public and private sectors in developing and using these energy sources are outlined. Specific technologies discussed are low, intermediate, and high temperature solar collectors, biomass, wind, and ocean energy systems, hydropower, geothermal systems, oil shale, and tar sands

N82-13547# Horstmann G m b H , Heiligenhaus (West Germany) A CENTRAL MICROPROCESSOR CONTROLLED ELECTRI-CAL STORAGE HEATING SYSTEM Final Report

Hendrik Horstmann Bonn Bundesministerium füer Forschung und Technologie Dec 1980 26 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-80-182, ISSN-0340-7608) HC A03/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 5,50

The use of a microprocessor to control the reloading of electrical storage heaters not only during the night, but whenever the electrical grid is cycled down, was tested. The test setup, used to control a total of about 10 MW installed storage heating in 96 dwellings, is described. It is demonstrated that additional consumers can be connected to the system without demand for more power stations Author (ESA)

N82-13553# Finnish Meteorological Inst, Helsinki SULFUR IN THE AIR IN THE CAPITAL (HELSINKI) METROPOLITAN AREA: ITASAT-PROJECT Final Report [PAEAEKAUPUNKISEUDUN ILMAN RIKKI ITASAT-PROJEKTIN LOPPURAPORTTI]

Markku Wallin, Eija Lumme, Markku Hietamaeki, and Erkki Rantakrans 1981 86 p refs in FINNISH (RR-61471) Avail NTIS HC A05/MF A01

Methods for regionally producing and processing information about air quality, air protection measures, and determining alternative examples for air protection solutions are assessed The sulfur dioxide content of air is predicted. The effects of various air protection measures and their cost (flue gas desulfurization, use of low sulfur heavy fuel oil) are compared

N82-13558# Oak Ridge Associated Universities, Tenn for Energy Analysis RESPONSE OF THE OCEANS TO INCREASING ATMO-

SPHERIC CARBON DIOXIDE C F Baes, Jr Aug 1981 72 p refs

(Contract DE-AC05-760R-00033) (DE81-028178, ORAU/IEA-81-6(M))

HC A04/MF A01

The relevant physical and chemical features of the ocean. the observational evidence of its response to increasing atmospheric carbon dioxide, and the uncertainties involved in modeling this response are considered. The deep oceans are near saturation with calcite. The pressure dependence of this solubility and ocean circulation produces calcite supersaturation of the upper ocean This condition is maintained by photosynthesis and the biogenically controlled precipitation of calcium carbonate. After correcting the effects of biological processes on the composition of seawater, it is evident that the increasing carbon dioxide content of the atmosphere affects the distribution of carbon in the upper

N82-13559# Mathtech, Inc., Princeton, N. J. ENVIRONMENTAL IMPACTS OF ENERGY TRANSPORTA-TION Final Report

J P. Price Electric Power Research Inst Sep 1981 243 p refs Sponsored by Electric Power Research Inst (EPRI Proj TPS-76-661)

(DE82-900316. EPRI-EA-2039) NTIS

HC A11/MF A01

The environmental impacts of fuel transportation for the electric utility industry are reviewed. The transportation of coal, oil, natural gas, liquified natural gas methanol and hydrogen are covered The major impacts coal unit trains are the creation physical barriers, potential accidents, and noise It is indicated that more emphasis should be placed on the evaluation of the environmental socio-economic impacts of fuel transportation

N82-13560# Oak Ridge National Lab , Tenn CONTROL OF HYDROCARBONS AND CARBON MONOXIDE VIA CATALYTIC INCINERATION

C H Brown, Jr and J A Klein Sep 1981 113 p refs (Contract W-7405-eng-26)

(DE82-000508. ORNL/TM-7787)

NTIS Avail

HC A06/MF A01

Eight commercially available incineration catalysts are evaluated experimentally to assess their application to control hydrocarbon and carbon monoxide emissions in the tail gases from a Lurgi substitute natural gas plant, which is simulated using bottled gas mixtures. Catalysts are evaluated with respect to the effects of temperature, space velocity, and the presence of hydrogen sulfide and carbonyl sulfide on hydrocarbon and carbon monoxide conversion. The most effective catalysts are a precious metal based catalyst on a monolithic substrate and a nonprecious metal oxide deposited on a solid substrate formed into 32 mm diameter spheres

N82-13565# Los Alamos Scientific Lab , N Mex **ENVIRONMENTAL AND RADIOLOGICAL SAFETY STUDIES:** INTERACTION OF (238) PuO2 HEAT SOURCES WITH TERRESTRIAL AND AQUATIC ENVIRONMENTS Quarterly Progress Report, 1 Jan. - 31 Mar. 1981

Glenn R Waterbury (comp) Sep 1981 42 p refs (Contract W-7405-eng-36)

(DE81-032019, LA-8932-PR) Avail 'NTIS HC A03/MF A01 The effects on the heat source of terrestrial and aquatic environments to obtain data for design of even safer systems were studied. Data obtained in several ongoing experiments are presented and include data from environmental chamber experiments that simulate terrestrial conditions, experiments to measure PuO2 dissolution rates, soil column experiments to measure sorption of plutonium by soils, and aquatic experi-DOF ments

N82-13566# Pacific Northwest Lab , Richland, Wash TREATMENT OF BIOMASS GASIFICATION WASTE-WATERS USING REVERSE OSMOSIS

S E Petty, S D Eliason, and M M Laegreid Sep 1981 44 p refs

(Contract DE-AC06-76RL-01830)

(DE82-000698, PNL-4018) Avail NTIS HC A03/MF A01 Reverse osmosis (RO) as a treatment technology for the removal of organics from biomass gasification wastewaters (BGW) generated from an experimental biomass gasifier was evaluated Since RO is normally considered a complementary treatment technology, wastewaters were pretreated by biological or wet air oxidation (WAO) processes. This membrane is similar to the NS-100, a membrane which is effective in the separation of organics from solution. Separation of organics from solution was determined by COD removal. Membrane degradation was observed when using full strength and WAO pretreated feeds, but not when using feeds that had undergone biological pretreatment Color removal was computed for the majority of experiments completed DOE

N82-13567# Pacific Northwest Lab , Richland, Wash TREATMENT OF BIOMASS-GASIFICATION WASTEWA-TERS BY WET-AIR OXIDATION

C J English Sep 1981 30 p refs (Contract DE-AC06-76RL-01830)

(DE82-000935, PNL-4013) Avail NTIS HC A03/MF A01

Production of synthetic natural gas from gasification of biomass results in the generation of a high strength wastewater that is difficult to treat by conventional means. The use of wet air oxidation (WAO) as a treatment method for wastewaters was studied. It is suggested that oxidation of biomass gasification wastewaters (BGW) organics by WAO occurs in a stepwise fashion with large organic molecules first being hydrolyzed and then partially oxidized to low molecular weight intermediates. Complete oxidation of these intermediates is more difficult and most easily accomplished at high reaction temperatures. The best application of WAO to treatment of BGW appears to be as a pretreatment to biological treatment

N82-13573# National Oceanic and Atmospheric Administration. Office of Weather Research and Modification Boulder, Colo ENVIRONMENTAL EFFECTS OF POLLUTANTS FROM COAL COMBUSTION. 2: THE COLSTRIP, MONTANA POWER **PLANT**

C C VanValin, R F Pueschel, and D L Wellman Apr 1981 70 p refs 2 Vol

(Contract EPA-IAG-D5-E693)

(PB81-234114, NOAA-TM-ERL-OWRM-3, NOAA-81062609) Avail NTIS HC A04/MF A01 CSCL 13B

Aerosol samples from the plume of a power plant were analyzed for the presence of sulfates and nitrates with the transmission electron microscope using the BaCl2 and Nitron tests. Plume profile were measured for width and thicker Tracking or the plume of the coisting power plant plume with the aircraft provided plume trajectories that were influenced by the underlying terrain by being diverted by as much as 20 from the wind direction at plume altitude, or by being ducted along a valley it is indicated that there is no difference in ice nucleus concentrations between plume and ambient atmosphere, and the latter shows an increase of an order of magnitude GRA

N82-13576# Research Triangle Inst., Research Triangle Park.

ENVIRONMENTAL HAZARD RANKINGS OF POLLUTANTS GENERATED IN COAL GASIFICATION PROCESSES Final Report, Feb. - Apr. 1980

J G Cleland Jun 1981 400 p refs

(Contract EPA-68-02-3170)

(PB81-231698. EPA-600/7-81-101)

HC A17/MF A01 CSCL 13B

NTIS

An evaluation and ranking of environmental hazards associated with coal gasification is reported. Applied chemical analytical data were provided by (1) research with an experimental gasifier. and (2) sampling of four commercial gasification processes. Gas, liquid, tar, and solid streams were analyzed for 300 substances Hazard potential was measured Coals tested range from lignite to anthracite Approximately 50 representative pollutants are emphasized and ranked according to relative environmental hazard GRA potential

N82-13607# National Oceanic and Atmospheric Administration. Boulder, Colo Office of Marine Pollution Assessment ENVIRONMENTAL ASSESSMENT OF THE ALASKAN CONTINENTAL SHELF: ANNUAL REPORTS OF PRINCIPAL INVESTIGATORS FOR THE YEAR ENDING MARCH 1980.

VOLUME 5: HAZARDS Annual Report Feb 1981 665 p refs Sponsored in part by the Bureau of Land Management

(PB81-225732. NOAA-81052107)

HC A99/MF A01 CSCL 08G

NTIS Avail

Hazards caused by the environmental conditions are reported Environmental pollution resulting from the development of oil and gas resources in Alaskan waters was investigated

N82-13652# Oak Ridge National Lab , Tenn HEALTH AND SAFETY RESEARCH DIVISION Progress Report 1 Oct. 1979 - 31 Mar. 1981

Aug 1981 109 p refs (Contract W-7405-eng-26)

(DE81-026088, ORNL-5750) Avail NTIS HC A06/MF A01 Progress in health and safety research is reported. A summary of the major fields covered includes basic research in physical sciences, life sciences research and assessment, and multidisciplinary studies on the impact of alternative energy technology and

N82-13981* Jet Propulsion Lab., California Inst. of Tech.,

CONTROLLED SPEED ACCESSORY DRIVE DEMONSTRA-TION PROGRAM

Frank W Hoehn 15 Oct 1981 105 p refs (Contracts NAS7-100, DE-AI01-80CS-50194)

(NASA-CR-165010, JPL-Pub-81-83) Avail NTIS

HC A06/MF A01 CSCL 13F

A Controlled Speed Accessory Drive System was examined in an effort to improve the fuel economy of passenger cars Concept feasibility and the performance of a typical system during actual road driving conditions were demonstrated. The CSAD

system is described as a mechanical device which limits engine accessory speeds, thereby reducing parasitic horsepower losses and improving overall vehicle fuel economy. Fuel consumption data were compiled for fleets of GSA vehicles. Various motor pool locations were selected, each representing different climatic conditions. On the basis of a total accumulated fleet usage of nearly three million miles, an overall fuel economy improvement of 6 percent to 7 percent was demonstrated. Coincident chassis dynamometer tests were accomplished on selected vehicles to establish the effect of different accessory drive systems on exhaust emissions, and to evaluate the magnitude of the mileage benefits which could be derived

N82-13984# Smith (Wilbur) and Associates, New York
MEASURES OF EFFECTIVENESS OF TRANSPORTATION SYSTEMS MANAGEMENT Final Report

Apr 1981 43 p refs Prepared jointly with Tri-State Regional Planning Commission

(PB81-233884, UTMA-IT-09-00890-81-1) NTIS Avail HC A03/MF A01 CSCL 13B

The basic concepts of transportation systems management (TSM) by providing simple classification schemes, geographic conditions of applicability, relative measures of effectiveness, and techniques for quantification were developed. Two key elements are emphasized coordination of transportation activities, and maximization of efficiency and productivity. Some of the findings reported are (1) traffic engineering improvements, (2) demand management measures achieve reductions in vehicle miles of travel, and (3) bus lanes and priority entry treatments

N82-13985# Aerospace Corp , El Segundo, Calif Environment and Energy Conservation Div

EVALUATION OF TECHNIQUES FOR REDUCING IN-USE AUTOMOTIVE FUEL CONSUMPTION Final Report, Jun. 1976 - Mar. 1978

L Forrest, W B Lee, and W M Smalley Apr 1981 330 p refs Prepared in cooperation with Transportation Systems Center

(Contract F04701-77-C-0078)

(PB81-233298, DOT-TSC-NHTSA-81-13, DOT-HS-805833) Avail NTIS HC A15/MF A01 CSCL 13F

Techniques for reducing fuel consumption in the light duty road vehicle fleet are assessed Modification of vehicles, modification of traffic flow, and modification of driver behavior are considered. Factors included in the evaluation are fuel economy effects, safety impacts, availability for fleet implementation, and unit price in addition, the implementation of each technique is assessed with regard to number of vehicles impacted, fuel savings effected, national cost, potential problems, and required lead time Cost effective techniques are ranked in terms of their assessed potential for reducing fleet fuel consumption GRA

N82-13986# Transportation Systems Center, Cambridge, Mass HIGHWAY FUEL ECONOMY STUDY Final Report, Sep. 1979 - Mar. 1981

Robert L Mason and Russell W Zub Jun 1981 155 p refs (PB81-233850, DOT-TSC-NHTSA-81-18, DOT-HS-805873) Avail NTIS HC A08/MF A01 CSCL 13F

The fuel consumption changes attributable to speed reduction and compliance with the 55 MPH speed limit are described. The effects of vehicle size and type, and driver-controllable functions on vehicle fuel economy at highway speeds are discussed Most of the analytical work is related to passenger cars and light trucks, however, medium and heavy trucks, primarily commercial in application, have been included in the highway fuel economy analyses GRA

N82-14048# California Univ , Livermore Lawrence Livermore

LLNL 1981: TECHNICAL HORIZONS

Jul 1981 49 p

(Contract W-7405-eng-48)

(DE81-028265. UCRL-52000-81-7) Avail

HC A03/MF A01

Research programs are described in broad terms. A \$481 million operating budget is projected for fiscal year 1982, up nearly 13% from last year in projects for the Department of Energy and the Department of Defense, the Laboratory applies its technical facilities and capabilities to nuclear weapons design and development and other areas of defense research that include

NTIS

inertial confinement fusion, nonnucipal ordnances, and particlebeam technology LLNL is also applying its unique experience and capabilities to a variety of projects that will help the nation meet its energy needs in an environmentally acceptable man-

N82-14071# Arinc Research Corp., Annapolis, Md
THE USE OF FLIGHT MANAGEMENT COMPUTERS IN AIR CARRIER OPERATIONS IN THE 1980S Interim Report I Gershkoff Washington FAA Aug 1981 113 p refs (Contract DTFA01-80-C-10030) (AD-A105621, Rept-1378-11-1-2482, FAA-EM-81-10) Avail NTIS HC A06/MF A01 CSCL 09/2

The use of on-board flight management computers (FMCs) in air carrier operations has the potential for significant fuel savings. This report assesses the general capabilities of the FMCs currently available. From this information, economic benefits and rates at which aircraft would be equipped were developed. Minimum-cost flight profiles were enalyzed for various common conditions to determine the problems associated with incorporating the capabilities of FMCs into a heavy traffic Air Traffic Control environment

N82-14322# Los Alamos Scientific Lab . N Mex CHEMICAL ELEMENT CONCENTRATIONS IN LIQUIDS AND SOLIDS ASSOCIATED WITH POWER PLANTS USING FGD SYSTEMS

Lawrence Edward Wangen and Marianne Mills Jones Aug 1981 27 p refs

(Contract W-7405-eng-36)

(DE81-030422, LA-8929-MS) Avail NTIS HC A03/MF A01

Solid and liquid process steam samples from eight power plants using wet flue gas desulfurization (FGD) scrubbers were analyzed for the trace elements As, B Br, Cl, Cd, Co, Cr, F, Ga, I, Mo, Ni, Pb, S, Sb, Se, Th, U V, W, and Zn as well as several major and minor elements. Four plants burned high-sulfur coals and three burned low-sulfur coals. One plant used a low-sulfur lignite coal Four FGD systems used limestone, two used lime, and two used alkaline flyash as scrubbing reagent Elemental concentration data were used to identify chemical elements of concern regarding their potential for causing environmental harm as a result of the disposal of residues associated with FGD systems Calcium, Mg, Mn, Ni, Se, and SO4(2-) were identified as most generally problematic. The elements B, Cd, F, and Mo were judged as potentially problematic in certain situations Generally FGD liquors from power plants that burned low-sulfur western coals had highest concentrations of most trace elements

N82-14398# Ministry of Housing, Ottawa (Ontario) Project Planning Branch

RESIDENTIAL SITE DESIGN AND ENERGY CONSERVA-TION. PART 1: GENERAL REPORT

Jan. 1981 158 p

(DE81-904010, NP-1904010-Pt-1, ISBN-0-7743-6072-0)

Avail. NTIS HC A08/MF A01

The energy costs that can be saved by a subdivision design format related to energy conservation that is reasonably acceptable in marketing and aesthetic terms were determined. Six subdivision layouts were designed to densities ranging from 6.5 to 13.6 units per gross acre (1058 to 2232 units) or 16 25 to 34 units per gross hectare. Hourly radiation temperature, and wind characteristics for a year constitute the local climate data base. Six house types (from detached to apartment units) and seventeen basic house designs (mostly picked at random) were used. The method for calculating the set heat load and an analysis of the results are presented. The study shows that by way of the selection of the more energy efficient traditional house designs, orientation of buildings to maximize solar transmission, and landscaping to reduce the effect of wind, there is a possible residential space heating energy saving of up to 20% for a low density housing development

N82-14557# Conoco Norway, Inc., Oslo
OFFSHORE PETROLEUM INDUSTRY ENVIRONMENTAL DATA REQUIREMENTS: EMPHASIS ON REMOTE

Ronald L Gratz In ESA Appl of Remote Sensing Data on the Continental Shelf Jul 1981 p 31-43 refs

Avail NTIS HC A13/MF A01, ESA, Paris FF 125

Data quality and coverage requirements for the remote sensing of oceanographic and meteorological factors affecting the development of offshore hydrocarbon resources are considered. using a combination of fine-grid hindcasting and surface truth measurements. The establishment of data banks able to accumulate 20-30 years of climatological data for use in future designs is recommended. Special measurement programs are planned for data collection during storms. Remote sensing was used to measure several factors important to the petroleum industry, i.e., waves, winds, currents, and sea ice. Application to weather forecasting is shown. The use of surface truth data in the calibration and verification of measurements for remote sensing is suggested. Possible communications channels for the exchange Author (ESA) of remote sensing data are assessed

N82-14626# Open Univ , Milton (England) Energy Research

THE NUCLEAR CONTROVERSY: UNEQUAL COMPETITION IN PUBLIC POLICY-MAKING

lan Sanderson May 1980 76 p refs (ERG-035) Avail NTIS HC A05/MF A01

The public policy making process as regards nuclear power is analized and the epistemological basis for such an analysis is examined it is asserted that disputes over the development of nuclear power are not primarily about the objective facts of the matter but rather derive from differences in basic assumptions about, and evaluatory perceptions of, society, technology and the nature of progress. The balance of power in such disputes is therefore not mainly determined by the 'correctness' of the facts upon which a position rests but rather by the extent to which underlying assumptions and values accord with prevailing ideological themes. A meaningful debate can be guaranteed only through the establishment of institutional structures which provide a framework of truely democratic participation and equality of power and influence

N82-14632*# National Aeronautics and Space Administration Langley Research Center, Hampton, Va. DESIGN OF AN ENERGY CONSERVATION BUILDING Ronald N Jensen Nov 1981 32 p refs (NASA-TM-83175) Avail NTIS HC A03/MF A01 CSCL 10A

The concepts in designing and predicting energy consumption in a low energy use building are summarized. The building will use less than 30,000 Btu/sqft/yr of boarder energy The building's primary energy conservation features include heavy concrete walls with external insulation, a highly insulated ceiling, and large amounts of glass for natural lighting A solar collector air system is integrated into the south wall. Calculations for energy conservation features were performed using NASA's NECAP Energy Program T M

N82-14644# American Bar Association, Washington, D.C. Special Committee on Energy Law NEED FOR POWER AND THE CHOICE OF TECHNOLOGIES: STATE DECISIONS ON ELECTRIC POWER FACILITIES

Jun 1981 221 p refs (Contract DE-AC01-79RG-10004)

DOE/EP-10004/1) (DE81-025960.

HC A10/MF A01

NTIS

The decision-making processes at the state level regarding the licensing of electric generating facilities were assessed. The basic issues addressed are the need for power and choice of technology state decisions which directly influence and affect the nation's energy supply, and the tradeoffs involved in meeting energy demand. The areas of special emphasis included the legal mechanisms and regulatory procedures used to determine and resolve these issues. The effectiveness of state decision-making was assessed, focusing on legal and administrative histories and accommodation of intérests of concerned parties. Recent innovations to enhance the decision-making process were also assessed where applicable. No particular substantive results are advocated in the findings. The recommendations presented are broad in scone

N82-14645# Natural Resources Defense Council, Inc., San Francisco, Calif PROJECTING REGIONAL POTENTIALS FOR COST-EFFECTIVE ENERGY CONSERVATION AND RENEWABLE RESOURCE APPLICATIONS: A FEASIBILITY STUDY

01 ENERGY POLICIES AND ENERGY SYSTEMS ANALYSIS

1980 52 p refs (Contract DE-FG03-79CS-10045)

(DOE/CS-10045/T3) Avail NTIS HC A04/MF A01

The feasibility is discussed of preparing an instruction manual that would enable a modeler in a particular region to set up a calculation method or predicting energy use. Such a manual would concern itself primarily with the three energy-consuming sectors most relevant to utilities demand projections. Data requirements for each of the three sectors (residential, commercial, and industrial) are described and some initial guidance is provided as to how these needs can be filled. The methods for separate calculations of energy consumed by each end use in each sector are described. Each end use is discussed separately for the residential sector, but only in aggregate for the commercial and industrial sectors.

N82-14648# Purdue Univ, Lafayette, Ind Energy Policy Research and Information Program PROGRESS REPORT TO THE DEPARTMENT OF ENERGY IN SUPPORT OF BASIC ENERGY AND POLICY RESEARCH

15 Jul 1981 326 p refs (Contract DE-AS02-79ER-10044)

(DE81-025882, DOE/ER-10044/T1) Avail NTIS

HC A15/MF A01

Research areas include light path of carbon reduction in photosynthesis: heat transfer in coal-ash slags, mechanism of plant cell enlargement in Gymnosperms, emulsion stability in enhanced oil recovery, selective transfer phenomenon in friction and wear, conceptual design of the Purdue Compact Torus/Passive Liner Fusion Reactor, integration of farm level alcohol production consistent with the economic and labor constraints of a farming operation, and newsmedia coverage of selected energy policy proposals

N82-14650# Argonne National Lab , III Integrated Assessments and Policy Evaluation Group

ANALYSIS OF POTENTIAL COGENERATION IMPACTS ON ELECTRICITY GENERATION BY THE CENTRAL MAINE POWER COMPANY

Jerry L Gillette and Kenneth A Hub Apr 1981 36 p refs (Contract W-31-109-eng-38)

(DE81-029991, ANL/CNSV-TM-76) Avail NTIS HC A03/MF A01

Two types of cogeneration design - one utilizing a backpressure turbine, the other an extraction turbine - were studied. It was assumed that these facilities were constructed to produce electricity that could be sold to the electric utility. The analysis included a single-year study of two different capacity-purchase options under consideration by the electric utility. An extended period was also analyzed so that the effects of demand growth and additions and subtractions of capacity on the cogeneration potential could be examined. It is found that some savings of oil could be realized with coal-based cogeneration, and that the quantity of such savings are somewhat dependent on the purchase option, the demand growth rate, and the cogenerator design. It is concluded that both cogenerator designs have some economic viability, but that the backpressure turbine type has a decided advantage due to its significantly lower heat rate.

N82-14651# California Univ., Berkeley Lawrence Berkeley Lab. Energy and Environment Div

ANALYSIS OF THE ENERGY IMPACTS OF THE DOE APPROPRIATE ENERGY TECHNOLOGY SMALL GRANTS PROGRAM: METHOD AND RESULTS

Bart Lucarelli, Jeff Kessel, Josh Kay, Janet Linse, Susan Tompson, and Mark Homer Aug 1981 43 p refs

(Contract W-7405-eng-48)

(DE81-029844, LBL-12253-Rev) Avail NTIS

HC AQ3/MF AQ1

Methods for assessing the energy savings of projects in the appropriate technology program (AT) and how to apply these methods to obtain estimates of energy impacts was studied Program energy savings were estimated from project savings by statistical inference Direct energy savings and methods and results of the economic analysis are discussed Indirect energy savings and program energy savings and the methods used to obtain them are estimated Improvement of project selection which increase program energy savings and two approaches for conducting future energy impact studies are presented.

N82-14653# Department of Energy, Washington, D C Office of Market Analysis

NTIS

INTERNATIONAL ENERGY INDICATORS

R M Weiss, ed Jul 1981 30 p (DE81-028117, DOE/IA-0010/13) Avail HC A03/MF A01

Data are presented in graphs and tables on the following world crude oil production by area, annually, 1974 through 1980. and monthly, October 1980 through April 1981, OPEC crude oil productive capacity, installed, maximum sustainable, and available, by country, world crude oil and refined product inventory levels, 1975 through 1981, oil consumption in OCED countries. 1975 through 1981, USSR crude oil production and exports, 1975 through April 1981, free world (by country) and US nuclear electricity generation, 1973 through 1980 and January to May 1981 and current capacity by country. US domestic oil supply (monthly) 1977 through 1980, US gross imports of crude oil and products, 1973 and 1974 annually, and 1975 through 1980 and monthly from January to June 1981, cost of Saudi crude oil in current and 1974 dollars from December 1974 through March 1981, US coal trade from January 1975 to March 1981, US natural gas trade from January 1975 through April 1981, summary of US merchandise trade, quarterly, from Quarter 1, 1977 through Quarter 1, 1981, and US energy/GNP ratio. annually, 1974 through 1980, and quarterly from 1974 through March 1981

N82-14659# Energy, Inc., Idaho Falls, Idaho ENERGY RECOVERY FROM MUNICIPAL WASTE DEVELOPMENT PROGRAM FOR IDAHO FALLS, IDAHO Final Report

Jul 1981 155 p refs

(Cor:ract DE-AC01-79CS-20240) (DE81-029999, DOE/CS-2024

DOE/CS-20240/1) Avail NTIS

HC A08/MF A01

The development of a demonstration facility to show that fluidized-bed technology is a viable means to recover resources from municipal wastes in Idaho Falls is described. The tasks described include (1) evaluation of the energy market of Idaho Falls to identify potential customers for recovered energy and to determine what form of energy would be economically viable. (2) evaluation of the municipal solid waste of Idaho Falls, determining its approximate composition, heating value, production rates, and seasonal variations. (3) development of a resource recovery facility concept that will be economically attractive to the city and technically feasible, and (4) evaluation of such topics as zoning, legal limitations, and environmental aspects of the facility to determine its compatibility with the city of Idaho Falls.

N82-14662# California Univ. Berkeley Lawrence Berkeley
Lab Energy and Environment Div
POTENTIAL ENERGY SAVINGS IN THE RESIDENTIAL

SECTOR OF THE UNITED STATES

John Ingersoll Jun 1981 11 p refs Presented at the Intern

John Ingersoll Jun 1981 11 p refs Presented at the Intern Conf on Energy Use Management, West Berlin, 26-30 Oct 1981

(Contract W-7405-eng-48)

(DE81-028873, LBL-12862, CONF-811006-3) Avail NTIS HC A02/MF A01

The state-of-the-art computer program, DOE 21, was used to simulate the hour-by-hour thermal performance of residential buildings in the four major climate zones of the United States, and a life-cycle cost analysis was applied to determine the optimal energy requirement of a typical house demonstrate that present levels of energy consumption can be reduced by a factor of two without compromising health and comfort standards Within present technology, additional energy savings can be achieved but not yet in a cost-effective way

N82-14664# Oak Ridge Associated Universities, Tenn EDUCATION AND TRAINING IMPLICATIONS OF BIOMASS ENERGY SYSTEM USE

S E Bell, R M Gove, and J R. Little Aug 1981 44 p refs (Contract DE-AC05-760R-00033)

(DE81-029956, ORAU-182) Avail NTIS HC A03/MF A01 Direct observations of 189 biomass-related operations

Direct observations of 189 biomass-related operations combined with existing reports, feasibility studies, and expert opinion are used to assess the education and training implications of biomass energy system use. The number of permanent jobs

in activities related to biomass energy production could easily reach the hundreds of thousands by the end of the century However, national employment related to biomass energy will represent only a very small portion of the employment in any major occupational category in addition, an analysis of occupational skill requirements suggests that the impacts on education and training institutions are likely to be minimal Regional shortages could develop for foresters, forestry technicians, chemists, laboratory technicians, process operators, and certain engineers, but these are likely to be in response to economy-wide growth rather than biomass energy-related activity alone

N82-14803# Battelle Pacific Northwest Labs , Richland, Wash CARCINOGENIC EFFECTS OF COAL-CONVERSION MATERIALS

R A Renne and L G Smith Apr 1981 29 p refs Presented at the Ind Hyg and Occupational Med in Coal Conversion Proj Workshop, Washington, D.C., 7 Nov. 1980. Submitted for publication

(Contract DE-AC06-76RL-01830)

(DE81-028108, PNL-SA-9516, CONF-801143-2) Avail NTIS HC A03/MF A01

The correlation between mutagenesis and carcinogenesis data on complex mixtures (synfuel materials) was determined. The heavy distillate is highly mutagenic compared with the other materials tested and it was also highly carcinogenic in a mouse skin painting assay. The fractions, we give different results from those of the mutagenesis assays. The basic tar and the neutral tar skin carcinogenesis data correlate fairly well with the mutagenesis data. The need for caution against depending heavily on equating PNA content with carcinogenic activity is emphasized It is recommended that primary aromatic amines are also monitored

N82-14875# University of Southern California, Los Angeles Social Science Research Inst.

VALUE TREE ANALYSIS OF ENERGY SUPPLY ALTERNA-TIVES

William G Stillwell, Detlof vonWinterfeldt, and Richard S John Jun 1981 41 p refs (Contract MDA903-80-C-0194)

(AD-A105629, SSRI-81-2) Avail. NTIS HC A03/MF A01 CSCL 05/10

The use of value trees in multiattribute evaluations of energy supply alternatives was examined A value tree relating general values and concerns to specific value relevant attributes was constructed to compare three energy options. nuclear, coal, and a combined geothermal and conservation package. Both hierarchical and non-hierarchical weighting procedures were used to rate the energy options. Several additive multiattribute models were constructed and compared with holistic rankings and ratings of the three options. Three basic findings were. (1) hierarchical weights were steeper than non-hierarchical weights. (2) groups identified by their holistic first choice showed substantial agreement in their assessment of attribute weights, (3) convergence of MAU model parameters resulted in a 'common model', consistent with holistic evaluations of the pro-conservation group. and generally inconsistent with those of the pro-nuclear group This differential consistency between model composites and holistic evaluations is interpreted as a result of weight parameter distortions due to social desirability and a neglect to consider attribute value ranges when making weight judgments

N82-14900# Teknekron, Inc., McLean, Va ENVIRONMENTAL READINESS DOCUMENT. ADVANCED ISOTOPE SEPARATION PROGRAM

Aug 1981 56 p refs (Contract DE-AC01-79EV-10292) (DE81-029952, DOE/EP-0029) HC A04/MF A01

Avail. NTIS

The uncertainties to be resolved through research development and those that constitute a limit on the confidence that can be placed in the conclusions are addressed. The conclusions are presented, giving the probabilities of an adverse finding resulting from further environmental research. The impacts and concerns are treated without reference to specific sites or location. The technology from which the environmental concerns emerge is described Drawn from the technology program office and the Environmental Development plan for the Advanced Isotope Separation Program (AIS) is provided The likelihood of adverse findings concerning the environmental acceptability of the technology, the problems and uncertainties stemming from current or anticipated environmental regulation, and the environmental and control considerations is examined. On this basis, an assessment is offered of the existing or potential barriers to commercialization Environmental control research is discussed and associated costs are addressed. The impact of environmentalrelated costs on the cost of enriching uranium by the AIS techniques is also addressed. Current and possible new standards related to this technology are identified Estimates of relative chemical hazards are provided. The feed and product associated with the current nuclear fuel cycle facilities and the changes that may be required by introduction of AIS into the enrichment enterprise are characterized A glossary is included

N82-14910# Battelle Pacific Northwest Labs , Richland, Wash COMPARISON OF POTENTIAL RADIOLOGICAL CONSE-QUENCES FROM A SPENT-FUEL REPOSITORY VERSUS NATURAL-URANIUM DEPOSITS

M O Cloninger and O J Wick Dec 1980 15 p refs Presented at the ANS Waste Management Conf., Tucson, Ariz., 23-26 Feb.

(Contract DE-AC06-76RL-01830)

(DE81-028232, PNL-SA-8881, CONF-810217-19) Avail

NTIS HC A02/MF A01

The long term hazard from spent fuel in a geologic repository is found to be comparable to that of a large ore deposit, although the specific nuclide concentration in an individual fuel element is not duplicated in nature. A repository constructed within reasonable constraints present no greater hazard than a large ore deposit. The natural hazard due to some observed radioactive releases to the biosphere in the United States far exceeds any that could reasonably be expected from a spent-fuel repository. Use natural ore deposits as a basis for criteria for nuclear waste repositories is so variable that it does not allow a specific criterion to be stated in absolute terms. If the naturally radioactive environment is to be used as a criterion for repositories, the radiological quality of the environment in the immediate region of a specific repository, and an acceptable potential increase in that radiological content due to the existence of the repository should be considered

N82-14959# Comptroller General of the United States. Washington, D C

MILLIONS WASTED TRYING TO DEVELOP MAJOR ENERGY **INFORMATION SYSTEM** Report to the Congress

15 May 1981 81 p refs (AFMD-81-40) Avail NTIS HC A05/MF A01

A Federal energy information system created to improve Federal and State energy regulation by providing computerized access to current energy data is reviewed. It is concluded that the system failed because management deficiencies existed in planning, development, and implementation. Moreover, the cost and progress of the system was not monitored Poor communication among system developers and intended users at the Federal and State levels, lack of continuous involvement and support from top Federal management, and disruptions in both organization and personnel are also cited as reasons for the system's failure

N82-14987# California Univ , Livermore. Lawrence Livermore 1.ab

FUTURE OF ELECTRICITY FOR AUTOMOBILES: AD-VANCED ELEÇTRIÇ VEHICLE CONÇEPTS

Lawrence G. OConnell 29 Jul 1981 14 p refs Presented at 6th Elec Vehicle Council Symp , Baltimore, 21 Oct 1981 (Contract W-7405-eng-48)

(DE81-028235; UCRL-85526, CONF-811010-3) Avail. NTIS HC A02/MF A01

An electric vehicle, hybrid vehicle, and other nonpetroleum electricity based systems, such as a fuel cell vehicle are evaluated Performance criteria for such vehicles are presented and, in addition, various concepts that may be suitable for these vehicles are identified-their capabilities are discussed as well as the difficulties that must be overcome prior to commercialization DOF in each case

N82-15142# Waither Cie A G , Cologne (West Germany) PROCESS FOR REMOVING SULFUR OXIDES FROM GASES WITH DIRECT PRODUCTION OF A USABLE FINISHED

REACTION PRODUCT Final Report, Oct. 1980

Heinz Juergen Fischer and Georg Kremer Bonn Bundesministerium fuer Forschung und Technologie Jul 1981 38 p In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-81-102, ISSN-0340-7608) Avail HC A03/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 8

During the described phase of testing, the waste-water-free Walther-process could be advanced considerably and tried in the final process conception after a coal-fired power-station block The ammonia sulfate obtained as a waste-product, meets the requirements of the fertilizer industry. Further processing of this pulverous waste-product to obtain a marketable end-product was investigated and demonstrated in a pelletizing unit with subsequent drying in a drum-type drier. The possibility of reheating the gases in a FGD-plant (flue-gas desulfurization plant) without application of energy from foreign source was proven by the use of a regenerative heat exchanger As regards spray-drying, a variant was investigated, a partial flow of the high-temperature flue-gas was branched before the airheater and spray-drying of the oxidized scrubbing liquid resulting from the desulfurization process was carried out in this partial flow. Author

N82-15168# KHD Humboldt Wedag A.G., Cologne (West "Haupabteilung Forschung und Entwicklung BAKING OF CARBON ANODES FOR THE ELECTROLYSIS OF ALUMINUM BY ELECTRIC RESISTANCE HEATING Final Report, Apr. 1980

Ernst Schultze-Rhonhof Bonn Bundesministerium fuer Forschung und Technologie Sep 1981 41 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-81-168, ISSN-0340-7608) HC A03/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 8,60

A distinct reduction of the energy input compared with the usual methods is possible when electric energy is substituted for fossil energy Carbon anodes in a 1.1 scale can be baked uniformly by direct electric resistance heating. The characteristic chemical and physical data meets all requirements of the aluminum industry. The energy input has not yet come up to expectations

N82-15210# Oak Ridge National Lab., Tenn Metals and Ceramics Div

US CERAMIC HEAT EXCHANGER TECHNOLOGY: STATUS AND OPPORTUNITIES

V J Tennery 1981 5 p Presented at the Conf on Advancement ın Heat Exchangers, Dubrovnik, Yugoslavia, 7 Sep. 1981 (Contract W-7405-eng-26)

(DE81-029686. CONF-810946-1)

HC A02/MF A01

The status of ceramic heat exchanger technology in the United States is reviewed including the basis for interest in designing, building, and demonstrating these components for application in energy systems. Ceramic heat exchangers for waste heat recovery and for advanced energy systems are discussed

N82-15219# Wisconsin Univ. Madison Dept of Mechanical Engineering

SURVEY OF PROPOSED METHODS OF BURNING ALCO-HOL IN DIESEL ENGINES

D E Foster 1980 10 p refs Presented at the Canadian Natl Power Alcohol Conf., Winnipeg, Manitoba, 20 Jun 1980 (Contract DE-AC02-79CS-50025)

(DE81-025834, CONF-8006185-1) Avail: NTIS HC A02/MF A01

Different methods of burning alcohol in diesel engines are discussed. The primary difficulty in using alcohol as a diesel fuel is initiation of the flame. The methods are categorized by the ignition technique used, spark or hot surface; pilot injection which includes twin injection and fumigation, cetane improvement and diesel/alcohol mixtures Each method is analyzed on the basis of the maximum amount of alcohol that can be substituted for diesel fuel and the likelihood for retrofitting on current engines. It is concluded that emulsification and fumigation are currently the two most feasible methods for adapting diesel engines to burn alcohol

N82-15242# California Univ. Berkeley Lawrence Berkeley Lab Energy and Environment Div

THEORETICAL BASIS OF THE DOE-2 BUILDING ENERGY USE ANALYSIS PROGRAM

Richard B Curtis Apr 1981 15 p refs Presented at the Intern Energy Agency Conf , West Berlin, 6-10 Apr 1981 (Contract W-7405-eng-48)

(DE81-028896, LBL-12300) Avail NTIS HC A02/MF A01 A user-oriented, public domain, computer program was developed that will enable architects and engineers to perform design and retrofit studies of the energy-use of buildings under realistic weather conditions. The DOE-2 1A has been named by the US DOE as the standard evaluation technique for the Congressionally mandated building energy performance standards (BEPS) A number of program design decisions were made that determine the breadth of applicability of DOE-2 1 Such design decisions are intrinsic to all building energy use analysis computer programs and determine the types of buildings or the kind of HVAC systems that can be modeled in particular, the weighting factor method used in DOE-2 has both advantages and disadvantages relative to other computer programs

N82-15367# Technische Universitäet, Hanover (West Germany) Abt. Kaeltetechnik

ROTATING REGENERATIVE HEAT EXCHANGER FOR ENERGY RECOVERY IN CHEMICAL PLANTS Final Report,

Reinhard Vauth Bonn Bundesministerium fuer Forschung und Technologie Jul. 1981 198 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-81-099. ISSN-0340-7608) HC A09/MF A01, Fachinformationszentrum, Karlsruhe, West

Germany DM 36,30

The behavior of a rotary heat exchanger was analyzed with special regard to heat and mass transfer Parallel to measurements at such a rotary heat exchanger with non-absorbant matrix a mathematic model was developed to simulate the heat and mass transfer. The correlation of experimental and theoretical results shows that the experimental data can be calculated by the mathematical model within an accuracy which is usual for calculating heat and mass transfer. Within a variation of several parameters for the working medium (humid air) the influences of operating conditions on the exchange characteristic of regenerative heat exchangers with rotating matrix were examined A study of parameters with the working medium flue-gas. which was thought as a possible application of the mathematic model, confirms the results which were found with the working medium humid air Author

N82-15453# Department of Energy, Bartlesville, Okla Technology Center

AUTOMOTIVE FUEL ECONOMY: POTENTIAL IMPROVE-MENT THROUGH SELECTED ENGINE AND DIFFERENTIAL GEAR LUBRICANTS Final Report Ted M Naman Jul 1981 50 p refs (Contract DO-SC-RA-78-19)

(PB81-240467, DOT-TSC-NHTSA-81-8, DOT-HS-805895)

Avail NTIS HC A03/MF A01 CSCL 21G

The effects of four engine lubricants and three differential gear lubricants on the fuel economy of two 1978 automobiles operated at 20F, 70F, and 100F ambient temperatures are evaluated. The engine lubricants were evaluated using the 1978 Federal Test procedure and steady state tests from a cold start. The gear lubricants were evaluated in steady state operation from a cold start GRA

N82-15488* # Lockheed Engineering and Management Services Co , Inc , Houston, Tex

INVESTIGATION OF THE APPLICATION OF REMOTE SENSING TECHNOLOGY TO ENVIRONMENTAL MONITOR-

M L Rader, Principal Investigator Aug. 1980 76 p ERTS (Contract NAS9-15800) (E82-10010; NASA-CR-161071, JSC-16759, LEMSCO-15175)

Avail NTIS HC A05/MF A01 CSCL 13B

Activities and results are reported of a project to investicate the application of remote sensing technology developed for the LACIE, AgRISTARS, Forestry and other NASA remote sensing projects for the environmental monitoring of strip mining, industrial pollution, and acid rain Following a remote sensing workshop for EPA personnel, the EOD clustering algorithm CLASSY was selected for evaluation by EPA as a possible candidate technology LANDSAT data acquired for a North Dakota test sight was clustered in order to compare CLASSY with other algorithms

A.R H

N82-15514# Teknekron, inc. McLean, Va

COAL RESOURCES AND SULPHUR EMISSION REGULA-TIONS: A SUMMARY OF 8 EASTERN AND MIDWESTERN STATES Final Report, Apr. 1979 - Mar, 1981

Richard A Chapman and Marcella A Wells May 1981 112 p refs Prepared for Versar, Inc., Springfield, Va

(Contract EPA-68-02-3136)

(PB81-240319, EPA-600/7-81-086)

ad: NTIS

HC A06/MF A01 CSCL 13B

Coal resources, current coal use, and the effectiveness of SO2 control strategies for use by coal users, regulators, and administrators in future coal related decisions were analyzed. The eight major eastern and midwestern coal producing states are discussed and each state's analysis includes a general overview of the coal industry, an overview of coal properties, a description of major coal seams, an analysis of the quantity of coal available to meet various SO2 emission regulations, and information regarding the sulfur content of coals used by utilities in 1979 Physical coal cleaning and the use of low sulfur coal as viable emission control strategies are emphasized. The coal assessment processor model was developed to determine the quantity of coal that would be available in each state to meet various SO2 emission regulations using one or a combination of alternative SO2 control technologies.

N82-15543# Brookhaven National Lab , Upton, N Y Dept. of Energy and Environment

ROLE OF LARGE SCALE ENERGY SYSTEMS MODELS IN R&D PLANNING

J Lamontagne Nov 1980 13 p refs Presented at the ORSA/TIMS Conf , Colorado Springs, 9 Nov 1980 (Contract DE-AC02-76CH-00016)

(DE81-026058, BNL-29751, CONF-801126-3) Avail NTIS HC A02/MF A01

The development of alternative technologies to provide new sources of energy and extend the lives of current ones is discussed. The influence of model results on energy policy makers who are not knowledgable about flaws or uncertainties in the models, errors in assumptions in model inputs which can result in faulty forecasts, the overall usefulness of energy system models, and model limitations are discussed. It is concluded that energy models should be clearly related to specific issues and methodologies should be clearly related to specific decisions, and allow adjustments to be easily made for alternative assumptions and for additional knowledge gained during the evolution of the energy system.

N82-15553# Stoller (S M) Associates, New York
POTENTIAL CONTRIBUTION OF CURRENTLY OPERATING
NUCLEAR-FUELED ELECTRIC-GENERATING UNITS TO
REDUCING US OIL CONSUMPTION

R H Koppe, Eric A J Olson, and Kenneth R VanHowe 30 Sep 1980 56 p Prepared for ORNL

(Contract W-7405-eng-26)

(DE81-030497, ORNL/Sub-80/40416/1) Avail NTIS

HC A04/MF A01

The prospect for performance improvement in the 62 operating light water reactors was examined. It is found that in the short term, capacity factor improvement of about 16 percent can be achieved, in response to a short term energy crisis. In the long term a gain of 18 percent can be achieved. Such gains represent a decrease in equivalent oil consumption of approximately 350,000 barrels a day. Potential increases in the operating power level of these units, are evaluated. This total short term power level increase would be equivalent to 138,000 barrels of oil per day.

N82-15554# Department of Energy, Washington, D C Office of Energy Management and Extension

ANNUAL REPORT TO THE PRESIDENT AND THE CON-GRESS ON THE STATE ENERGY CONSERVATION PRO-GRAM FOR CALENDAR YEAR 1980 Jul 1981 40 p (DE81-025862.

DOE/CE-0016)

Avail. NTIS

HC A03/MF A01

The activities of the fifth year's operation (December 1979 through December 1980) of the state energy conservation program are reported. The program requires states to develop and implement plans that will reduce projected energy consumption by 5% or more in 1980. Five program measures required to be eligible for financial assistance under the plan and three program measures under a supplemental plan are described and outlined. The details of program operation and results to date are reported. Program measures are described. The President's Program for economic recovery is evaluated.

N82-15555# Pacific Northwest Lab , Richland, Wash TECHNOLOGY CHANGE AND ENERGY CONSUMPTION: A COMPARISON OF RESIDENTIAL SUBDIVISIONS

L A Nieves and A L Nieves 1981 38 p Presented at the 56th Ann Conf of the Western Econ Assoc, San Francisco, 2-6 Jul 1981

(Contract DE-AC06-76RL-01830)

(DE81-030075, PNL-SA-9049, CONF-810757-2) Avail NTIS HC A03/MF A01

The energy savings in residential buildings likely to result from implementation of the building energy performance standards (BEPS) were assessed. The goals were to compare energy use in new homes designed to meet or exceed BEPS levels of energy efficiency with that in similar but older homes designed to meet conventional building codes, and to survey the home owners regarding their energy conservation attitudes and behaviors and to ascertain the degree to which conservation attitudes and behaviors are related to residential energy use. The consumer demand theory which provides the framework for the empirical analysis is presented. The sample residences are described and the data collection method discussed. The definition and measurement of major variables are presented.

N82-15556# Minnesota Geological Survey, St Paul MOORHEAD DISTRICT HEATING, PHASE 2 Final Report R E Sundberg Jan 1981 429 p refs (Contract DE-AC02-78CS-20074) (DE81-029689, DOE/CS-20074/1) Avail NTIS

HC A19/MF A01 The feasibility of developing a demonstration cogeneration hot water district heating system was studied. The district heating system would use coal and cogenerated heat from the Moorhead power plant to heat the water that would be distributed through underground pipes to customers or their space and domestic water heating needs, serving a substantial portion of the commercial and institutional loads as well as single and multiple family residences near the distribution lines. The technical feasibility effort considered the distribution network, retrofit of the power plant, and conversion of heating systems in customers' buildings to use hot water from the system. The system would be developed over six years. The economic analysis consisted of a market assessment and development of business plans for construction and operation of the system Rate design methodology, institutional issues, development risk, and the proposal for

N82-15567# Edgerton, Germeshausen and Grier, Inc., Idaho

DOE

MICRO-HYDROPOWER IN THE UNITED STATES

R O Haroldsen and F B Simpson 1981 9 p refs Presented at WATERPOWER 1981 Conf., Washington, D C., 22 Jun 1981

(Contract DE-AC07-76ID-01570)

implementation are discussed

(DE81-028271, EGG-M-02781, CONF-8106137-5) Avail NTIS HC A02/MF A01

The interest and problems relating to the development of micro-hydropower. i.e., capacities of less than 100 kW, was assessed A total of 62 individuals from 10 states and 4 groups, i.e., developers. A/E firms, equipment manufacturers, and state and federal agencies, were polled to determine their perceptions of the advantages and disadvantages of micro-hydro developments

and the needs for such developments. Financing, technical assistance, and help with the economic analysis and regulatory aspects of micro-hydro development appeared to be the paramount needs. Whether or not a specific site can be successfully developed depends on site conditions. A micro-hydro plant discussed as

01 ENERGY POLICIES AND ENERGY SYSTEMS ANALYSIS

an example is shown to be a poor investment, e.g., maximum \$200 per month return on \$60,000 investment.

N82-15583# Vereinigte Elektrizitaetswerke Westfalen AG. Dortmund (West Germany) Bereich Marketing ENERGY CONSUMPTION ANALYSIS AND COMPARATIVE STUDY OF THE OPERATIONAL RESULTS FROM HEAT PUMP PLANTS Final Report, Oct. 1979

Peter Mueller, Bernd Bewer, Heinz Klaus, Walter Sander, and Hans Joachim Guenther Wirthwein Bonn Bundesministerium fuer Forschung und Technologie Dec. 1980 240 p refs In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

ISSN-0340-7608) (BMFT-FB-T-80-109; NTIS Avail. HC A11/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 40,50

Electric energy consumption with inclusion of the electricity consumption of the supplementary and auxiliary equipment is considered. Costs are divided into plant costs for heat pumps, heating systems and auxiliary equipment, installation costs for heat pumps, heating systems and auxiliary equipment, operating costs and maintenance costs. Specific energy consumption and cost statements were determined Operational experiences were reviewed and the energetic operational behavior, including supplementary and auxiliary equipment for a random test of plants, is discussed Author (ESA)

N82-15589# Mitre Corp., McLean, Va Metrek Div ENERGY AND DEVELOPMENT IN CENTRAL AMERICA. VOLUME 1: REGIONAL ASSESSMENT Final Report, Oct. 1979 - Feb. 1980

Wayne Park, Wayne Park, Carole Neves, Ranvir Trehan, William Gallagher, Phillip Palmedo, Andres Doernberg, Kerth Oberg, and Steven Kyle Feb 1980 128 p refs Prepared in cooperation with Energy/Development International 2 Vol (Contract AID/SOD/PDC-C-0146)

(PB81-231540, MTR-80W601-Vol-1) Avail NTIS HC A07/MF A01 CSCL 10A

A regional energy assessment of six Central American countries is presented. The purpose is to assist these countries in defining, planning, and meeting energy requirements implicit in their economic and social development goals. The following topics are treated. Central America Regional energy assessment. energy issues, geographical, social, and economic aspects, energy resources, current energy use and future energy use, energy

N82-15590# Mitre Corp. McLean, Va METREK Div ENERGY AND DEVELOPMENT IN CENTRAL AMERICA. VOLUME 2: COUNTRY ASSESSMENTS Final Report, Oct. 1979 - Feb. 1980

Wayne Park, Carole Neves, Ranvir Trehan, William Gallagher, Phillip Palmedo, Andres Doenberg, Keith Oberg, and Steven Kyle Mar 1980 350 p refs Prepared in cooperation with Energy/Development International 2 Vol (Contract AID/SOD/PDC-C-0146)

(PB81-231557. MTR-80W602-Vol-2) NTIS Avail HC A15/MF A01 CSCL 10A

An energy assessment for each of six Central American countries - Guatemaia, El Savador, Honduras, Nicaragua, Costa Rica, and Panama is presented The program assists the U.S. Agency for International Development and other development organizations in defining energy programs in Central America The following issues are treated separately for each individual country, geographic, social and economic aspects, energy resources, current and future energy use, energy strategies GRA

N82-15591# Tata Inst of Fundamental Research, Bombay (India) **Documentation Centre**

INDIAN ENERGY ABSTRACTS

Mar 1981 46 p (PB81-232316) Avail NTIS HC A03/MF A01 CSCL 10A The document provides abstracting coverage of scientific and technical energy literature originating from Indian Government Departments, Universities, National Laboratories, and other research institutions including industries. The scope encompasses all forms of renewable sources of energy and more efficient and less polluting use of fossil and fissile fuels

N82-15592# National Academy of Sciences - National Research Council, Washington, D. C. Advisory Committee on Technology Innovation

SUPPLEMENT TO ENERGY FOR RURAL DEVELOPMENT: RENEWABLE RESOURCES AND ALTERNATIVE TECHNOL-OGIES FOR DEVELOPING COUNTRIES Final Report

1981 248 p refs (Contract AID/TA-C-1433)

(PB81-231011, ·CIR/BOSTID/38) NTIS Avail HC A11/MF A01 CSCL 10A

The publication energy for rural development renewable resources and alternative technologies for developing countries. which presented information on a variety of subjects, including direct uses of solar energy (heating, cooling, distillation, crop drying, photovoltaics), indirect uses of solar energy (wind power, hydropower, photosynthesis, biomass), geothermal energy, and energy storage is reviewed. New technologies developed and advances made in technologies are discussed

N82-15594# Bureau of the Census, Washington, D C FUELS AND ELECTRIC ENERGY CONSUMED Feb 1981 25 p

(PB81-240442, MIC-77-SR-5) Avail NTIS HC A02/MF A01 CSCL 08L

The following topics on energy consumption are reported general summary, type of operation, size of establishment, type of organization, assets and capital expenditures, fuels and electric energy consumed, and water use

N82-15596# Prins Maurits Lab TNO, Rijswijk (Netherlands) Inst voor Chemische en Technologische Research POLLUTION OF THE SOIL BY AVIATION GASOLINE A Verweij Aug 1979 26 p ref In DUTCH, ENGLISH (Contract A78/KL4/146)

(PML-1979-41, TDCK-73390) Avail NTIS HC A03/MF A01 A literature search was conducted to determine the effects of aviation gasoline spills and more general oil spills on the environment and on the condition of oil storage tanks Remedial measures are presented Attention is given to natural restoration processes as well as to actions to speed up these processes

N82-15598# Battelle Pacific Northwest Labs , Richland, Wash ECOLOGICAL EFFECTS ASSESSMENT: REQUIREMENTS VS STATE-OF-THE-ART

D H McKenzie, J M Thomas, and L L Eberhardt May 1981 31 p refs Presented at the 3rd Conf on Waste Heat Management and Utilization, Miami, Florida, 12 May 1981 (Contract DE-AC06-76RL-01830)

(DE81-028092, PNL-SA-9292, CONF-810545-5) Avail NTIS HC A03/MF A01

Current requirements and the state-of-the-art in ecological effects assessments in regard to nuclear power plants are studied The current cooling system approaches, data collection programs, and ecological effects assessments are discussed. A timely review and evaluation of current practice is called for The magnitude of economic and environmental resources being committed to cooling system alternatives mandates that the decision-making process result in as many optimal choices as possible. In addition, the resources being devoted to environmental data collection and integration provide considerable motivation for providing meaningful input to the decision-making process. It is maintained that the input should be as quantitative and as free from subjective content as is reasonably possible. An alternative viewpoint suggests that the past several decades of experience be considered but a first step, and the current task to be one of designing a second step

N82-15602# California Univ , Livermore Lawrence Livermore

THREE-DIMENSIONAL FINITE ELEMENTAL MODEL FOR SIMULATING HEAVIER-THAN-AIR GASEOUS RELEASES OVER VARIABLE TERRAIN

Robert L Lee, Philip M Gresho, Stevens T Chan, and Craig D Upson Aug 1981 17 p refs Presented at the NATO/CCMS 12th Intern. Tech Meeting on Air Pollution Modeling and its Applications, Menlo Park, Calif., 25-28 Aug. 1981. Submitted for publication

(Contract W-7405-eng-48) (DE81-028689, UCRL-85520, CONF-810841-1) Avail NTIS HC A02/MF A01

A 3 dimensional finite element model was developed to predict the dispersion processes associated with heavier than air gaseous releases in the atmosphere Both 2 dimensional and 3 dimensional examples presented to demonstrate the flexibility of the model in simulating the motion of the vapor cloud generated after a liquid natural gas spill over flat or variable terrain Also presented are results to justify the slightly more complex generalized anelastic model rather than one employing the Boussinesq and/or hydrostatic approximation, which are routinely used for planetary boundary layer flows but can be inappropriate for this application

N82-15605# Data Resources, Inc., Lexington, Mass REGIONAL LOAD-CURVE MODELS: SCENARIO AND FORECAST USING THE DRI MODEL Final Report

H D Platt Aug 1981 283 p Sponsored by Electric Power Research Inst

(EPRI Proj 1008)

(DE81-904192, EPRI-EA-1672-Vol-3) Avail. NTI

HC A13/MF A01

Regional load curve models were constructed for 32 regions that were created by aggregating hourly load data from 146 electric utilities. The forecast scenario is described and the forecast resulting from the use of this scenario is presented. The highlights of this forecast are two observations, first, peak demands will once again become winter phenomena. In the heating season, the model is reponsive to the number of heating degree hours, the penetration rate of electric heating equipment, and the rate at which this space conditioning equipment is utilized. Winter season demands grow more rapidly than demands in other seasons and peaks begin to appear in winter months. Secondly load factors begin to increase in the forecast, reversing the trend which began in the early 1960s. Nationally, load factors do not leap upwards, instead they increase gradually.

DOE

N82-15607# California Univ , Berkeley Lawrence Berkeley Lab Energy and Environment Div

KINETICS OF REACTIONS IN A WET FLUE GAS SIMULTAN-EOUS DESULFURIZATION AND DENITRIFICATION SYSTEM

S G Chang, D Littlejohn, and N H Lin Jul 1981 36 p refs Presented at the ACS Symp on Advan in Flue Gas Desulfurization, Atlanta, 30 Mar - 3 Apr 1981 (Contract W-7405-eng-48)

(DE81-029853, LBL-13063, CONF-810394-1) Avail NTIS HC A03/MF A01

A number of processes for simultaneous removal of SO2 and NO sub x are discussed. They are based on either the oxidation of relatively insoluble NO to more soluble NO2 or the employment of a water soluble ferrous chelating compound as a catalyst to aid in the absorption of the insoluble NO. These ferrous compounds have the ability to form complexes with the NO and thus promote the absorption of the NO Once in solution NO sub x can be reduced by the absorbed SO2 to form molecular N2, N2O or reduced nitrogen compounds such as NOH(SO3)2(-2), NH(SO3)2(-2), NH2SO(-) and NH4(+), while SO2 is oxidized to sulfate. The kinetics and mechanisms of reactions involved in this system are discussed.

N82-15608# University of Western Michigan, Kalamazoo Dept of Chemistry

FUNDAMENTALS OF NITRIC OXIDE FORMATION IN FOSSIL-FUEL COMBUSTION Progress Report, 29 Sep. -28 Dec. 1980

Thomas Houser and Michael E McCarville Aug 1981 19 p

(Contracts DE-AC21-76ET-10592, EX-76-C-01-2018)

(DE81-030329, DOE/E1-10593/ [2; FE-2018-19) Avail NTIS HC A02/MF A01

The rate and products of oxidation of HCN and the influence of additives, benzene, cyclohexane, toluene, acetylene and CO, on the rate and products were studied The only significant oxidation products in the absence of additives were CO2, H2O and N2 The complex order indicates that a complex chain mechanism is operating, however, the activation energy appears

too large for a chain or surface mechanism. HCN consumption dropped drastically and benzene consumption was reduced a small amount even at higher oxygen concentrations in the reactor. No change in products was observed it suggested that CO and acetylene produce an intermediate during oxidation that does not form when benzene oxidizes.

N82-15609# Brookhaven National Lab , Upton, N Y Dept. of Energy and Environment

REAL TIME COARSE PARTICLE MASS MEASUREMENTS IN A HIGH TEMPERATURE AND PRESSURE COAL GASIFIER PROCESS TREATMENT

J Wegrzyn, J Saunders, and W Marlow Mar 1981 9 p refs Presented at the 3rd Symp on the Transfer and Utilization of Particulate Control Technol , Denver, 10-12 Mar 1981 (Contract DE-AC02-76CH-00016)

(DE81-030036, BNL-22952, CONF-810319-3) Avail NTIS HC A02/MF A01

A probe appropriate for direct extracted sampling of erosive range particulate matter from a coal gasifier outlet or a high pressure fluidized bed combustor. The system consists of four modules (1) a null balance extraction probe with injection through a porous lined tube to minimize wall loss, (2) a stem type virtual impactor to separate coarse from fine particles. (3) a filter tape collector, and (4) a beta gauge total mass detector. A stem type virtual impactor separates at ambient gas stream conditions the coarse particles from the sampling stream so that at upon filtration no condensible vapors, fine particles or reactive gases pass through the filter tape.

N82-15610# California Univ , Livermore Lawrence Livermore Lab Environmental Sciences Div

ELEMENTAL COMPOSITION OF ATMOSPHERIC FINE-PARTICLES EMITTED FROM COAL BURNED IN A MODERN ELECTRIC POWER PLANT EQUIPPED WITH A FLUE-GAS DESULFURIZATION SYSTEM

J M Ondov Jul 1981 19 p refs Presented at the Am Chem Soc Meeting, Las Vegas, Nev, 1 Dec 1980 (Contract W-7405-eng-48)

(DE81-030073, UCRL-85035, CONF-801266) Avail NTIS HC A02/MF A01

Mechanisms of fine particle formation and chemical enrichment in the flue-gas desulfurization system are dicussed. Improved control devices drastically affect the quantity, chemical composition, and physical characteristics of fine particles emitted to the atmosphere from these sources. Fly ash aerosols were sampled upstream and downstream from a modern lime slurry, spray tower system installed on a 430 Mw(e) coal utility boiler. The concentrations of up to 35 elements and estimates of the size distributions of particles in each the fly ash fractions were determined by instrumental neutron activation analysis and by electron microscopy.

N82-15611# California Univ , Berkeley Lawrence Berkeley Lab Energy and Environment Div

INDOOR AIR QUALITY

C D. Hollowell Jun 1981 13 p refs Presented at the Inst of Gas Res Conf, Los Angeles, 28 Sep - 1 Oct 1981 (Contract W-7405-eng-48) (DE81-029857; LBL-12887, CONF-810909-4;

EEB-Vent-81-17) Avail NTIS HC A02/MF A01

Common sources of indoor air pollution in buildings, the specific pollutants emitted by each source, the potential health effects, and possible control techniques are discussed Rising energy prices, have generated an incentive to reduce ventilation rates and thereby reduce the cost of heating and cooling buildings. Reduced ventilation in buildings increases exposure to indoor air pollution it is suggested that reduced ventilation adversely affects indoor air quality unless appropriate control strategies are undertaken. The strategies used to control indoor air pollution depend on the specific pollutant or class of pollutants encountered, and differ depending on whether the application is to an existing building or a new building under design and construction. The first course of action is prevention or reduction of pollutant emissions at the source.

N82-15613# Pacific Northwest Lab., Richland, Wash.
ASSESSMENT OF THE LONG-RANGE TRANSPORT OF
RESIDENTIAL WOODSTOVE FINE-PARTICULATE EMISSIONS FOR TWO FUTURE UNITED STATES ENERGY

01 ENERGY POLICIES AND ENERGY SYSTEMS ANALYSIS

K J. Allwine, Jr May 1981 17 p refs Presented at the Intern Conf on Residential Solid Fuels, Portland, Oreg , 1-4 Jun

(Contract DE-AC06-76RL-01830)

(DE81-030096, PNL-SA-9606, CONF-810674-5) Avail NTIS HC A02/MF A01

The impact of solar energy technologies (especially woodstoves) on regional scale fine particulate air quality resulting from direct-energy-use sources was analyzed It is shown that significant interregional transport of fine particulates occurs especially into the three northeastern regions of the US It is indicated that concentrations are low relative to any current particulate standards. Both maximums occurred in the Middle Atlantic region. It is predicted that the concentrations in the eastern five regions will decrease from 1975 to 2000 (both scenarios) whereas the opposite is true for the five western regions. The contributions from woodstoves are projected to increase in all regions. The majority of this increase is due to woodstoves For the three northeastern regions more than 50% of the impact of each region is from outside the respective DOE

N82-15618# Battelle Columbus Labs . Ohio USE OF COAL CLEANING FOR COMPLIANCE WITH SO2 EMISSION REGULATIONS Final Report, Jun. 1977 - Jun.

E H Hall, A W Lemmon, Jr, G L Robinson, F K Goodman, J H McCreery, R E Thomas, and P A Smith Sep 1981 438 p refs

(Contract EPA-68-02-2163)

(PB81-247520, EPA-600/7-81-146, IERL-RTP-1244) Avail NTIS HC A19/MF A01 CSCL 13B

Results of an evaluation of coal cleaning as a means of controlling SO2 emissions from coal fired stationary sources are presented Coal cleaning was examined in the light of various existing and proposed SO2 emissions regulations to determine applications in which the technology would be most useful. Barriers were identified that prevent wider application of coal cleaning Actions are described which should be taken to overcome these barners. Much information about coal is compiled as resource data on the coal reserve base, present and projected coal production, coal cleanability, current and projected coal use by utilities and industry, size and age distribution of coal fired facilities, and the nature of coal contracts. Environmental impacts of coal cleaning are compared with those of other sulfur removal strategies such as flue gas desulfurization and the use of low sulfur coal Similarly, costs of the various SU2 control alternatives are compared

N82-15621# Environmental Protection Agency, Ann Arbor, Mich Standards Development and Support Branch

HEAVY-DUTY ENGINE BASELINE PROGRAM AND NO SUB X EMISSION STANDARD DEVELOPMENT (1972-73)

Timothy Cox, Zachary Diatchun, Thomas Nugent, Glenn Passavant, and Larry Ragsdale Mar 1981 69 p refs (PB81-244030. EPA-AA-SDSB-81-01) HC A04/MF A01 CSCL 13B NTIS

The statutory NOx emission standard for 1985 heavy duty engines was determined. The standard is based on a 75% reduction from the average measured emissions for uncontrolled (1972-73 model year) gasoline fueled heavy duty engines program established the amount of NOx emissions from the uncontrolled heavy duty gasoline-fueled engines. A baseline testing this program consists of four sectors (1) engine procurement, (2) restorative maintenance. (3) testing the engine emission levels by transient test procedure, and (4) determination of the average measured emissions

N82-15623# Research Triangle Inst , Research Triangle Park, N. C

SYMPOSIUM PROCEEDINGS: ENVIRONMENTAL AS-PECTS OF FUEL CONVERSION TECHNOLOGY, 5TH

Progress Report, Feb. - Aug. 1980
F. A. Ayer, comp. and N. S. Jones, comp. Jan. 1981 665 p. refs Proceedings of symp held in St Louis, 16-19 Sep. 1980 (Contract EPA-68-02-3170)

(PB81-245045: EPA-600/9-81-006) Avail. NTIS HC A99/MF A01 CSCL 13B

Environmental aspects of fuel conversion technology are

presented. Environmental information related to coal gasification, indirect liquefaction, direct liquefaction, program approach, environmental assessment, environmental control, and the development of pollution control guidance documents is in-

N82-15624# Geological Survey, Indianapolis, Ind Water Resources Div

EFFECTS OF COAL FLY-ASH DISPOSAL ON WATER QUALITY IN AND AROUND THE INDIANA DUNES NATIONAL LAKESHORE, INDIANA Final Water-resources **Investigation Report**

Mark A. Hardy Apr 1981 73 p refs (PB81-238479; USGS/WRD/WRI-81-073; USGS/WRI-81-16) Avail: NTIS HC A04/MF A01 CSCL 13B

Dissolved constituents in seepage from fly ash settling ponds bordering part increased trace elements, and gross alpha and gross beta radioactivity in ground water and surface water downgradient from the settling ponds It is suggested that concentrations of some dissolved trace element are greater beneath interdunal pond 2 than in the pond. It is found that calcium concentrations are greater in ground water downgradient from the settling ponds than in the ponds. Where organic material is present downgradient from the settling ponds, concentrations of arsenic, fluoride, molybdenum, potassium, sulfate, and strontium were greater in the ground water than in the ponds. In contrast, the concentrations of cadmium, cooper, nickel, aluminum, cobalt. lead, and zinc are less.

N82-15626# TRW, Inc., Research Triangle Park, N.C. Progress Center

DEMONSTRATION OF WELLMAN-LORD/ALLIED CHEMI-CAL FGD TECHNOLOGY: DEMONTRATION TEST SECOND YEAR RESULTS Final Report, Feb. 1973 - Oct. 1979

R C Adams, S W Mulligan, and R R Swanson Aug 1981 410 p refs

(Contract EPA-68-02-3174)

EPA-600/7-81-140) (PB81-246316; HC A18/MF A01 CSCL 13B

NTIS

NTIS

The performance over a 2 year period of a full scale flue gas desulfunzation (FGD) is reported. The process is regenerable. employing sodium sulfite wet scrubbing, thermal regeneration of the spent scrubber solution, and reduction to elemental sulfur of the recovered SO2 Process energy requirements, primarily for thermal regeneration of the scrubber solution and subsequent recovery of SO2, were quite large, amounting to 12 percent of the boiler heat input derived from fuel. Operation and performance occurred after some modification to the boiler to increase inlet flue gas temperature and after implementing FGD plant improvements identified during initial operation

N82-15633# Los Angeles County Sanitation District, Whittier, Calif

PARALLEL **EVALUATION** OF AIR-AND OXYGEN-ACTIVATED SLUDGE Final Report, Feb. 1975 - Dec. 1976 Scott Austin, Fred Yunt, Donald Wuerdeman, and Walter E Garnson Aug 1981 53 p

(Contract DI-14-12-150)

(PB81-246712. EPA-600/2-81-155) Avail.

HC A04/MF A01 CSCL 13B

The merits of air and oxygen in the activated sludge process, two 1900-cu m/day activated sludge pilot plant, one air and one oxygen system, were operated Both of the pilot plants met the applicable discharge limitations for everything but three trace metals, but the oxygen system provided a more stable operation Primary differences in performance concerned ammonia nitrogen removals and energy consumption

N82-15637# Energy Resources Co., Inc., Cambridge, Mass. POTENTIAL ENVIRONMENTAL PROBLEMS OF ENHANCED OIL AND GAS RECOVERY TECHNIQUES Final Report Ron Beck, Robert Shore, Terry Ann Scriven, and Melinda Lindquist Aug 1981 297 p refs (Contract EPA-68-03-2648) (PB81-240186, EPA-600/2-81-149) Avail NTIS

HC A13/MF A01 CSCL 13B

This report provides (a) an identification of and analysis of available data regarding EOR/EGR related pollutants; (b) an assessment of potential environmental impacts and an identification of possible controls, and (c) recommendations as to research needs. The following processes were studied steam injection, in situ combustion, carbon dioxide miscible flooding, micellar/polymer flooding, alkaline flooding, improved waterflooding, advanced hydraulic fracturing, chemical explosive fracturing, and directional drilling. The existing EOR/EGR environmental impact information (published and unpublished) is critically reviewed and summarized. The effect of EOR/EGR processes on air quality, groundwater quality, water quantity, noise levels, and secondary impacts is the main area of analysis.

N82-15651# Research Triangle Inst., Research Triangle Park, N. C.

PROCEEDINGS: SYMPOSIUM ON FLUE GAS DESULFUR-IZATION, VOLUME 1

Franklin A Ayer Apr 1981 548 p refs Symp held at Houston, Tex. 28-31 Oct 1980 (Contract EPA-68-02-3170)

(PB81-243156, EPA-600/9-81-019A-Vol-1) Avail NTIS HC A23/MF A01 CSCL 13B

Presentations of the flue gas desulfurization (FGD) conference are presented. They cover such subjects as approaches for control of acid rain, the Nation's energy future, economics of FGD, legislative/regulatory developments, FGD research/development trends, FGD system operating experience, FGD byproduct disposal/utilization, developments in dry FGD, and industrial boiler applications.

N82-15652# Research Triangle Inst., Research Triangle Park,

PROCEEDINGS: SYMPOSIUM ON FLUE GAS DESULFURIZATION, VOLUME 2

Franklin A Ayer, comp Apr 1981 551 p refs 6th Sympheld at Houston, Tex., 28-31 Oct 1980

(Contract EPA-68-02-3170)

(PB81-243164. EPA-600/9-81-019B) Avail NTIS HC A24/MF A01 CSCL 13B

Proceedings on flue gas desulfurization are documented Presentations covered the following subjects approaches for control of acid rain, the nation's energy future, economics of FGD, legislative/regulatory developments, FGD research/development trends, FGD system operating experience, FGD byproduct disposal/utilization, developments in dry FGD, and industrial boiler applications

N82-15833# California Univ , Livermore Lawrence Livermore

METHODOLOGY AND BASIC ALGORITHMS OF THE LIVERMORE ECONOMIC MODELING SYSTEMS

Robert B Bell 17 Mar 1981 43 p refs (Contract W-7405-eng-48)

(DE81-029430, UCRL-53131) Avail NTIS HC A03/MF A01

The methodology and the basic pricing algorithms used in the Livermore economic modeling system (EMS) are described Each algorithm's function is analyzed and a detailed derivation of the actual mathematical expressions used to implement the algorithm is presented DOE

N82-16012# Applied Decision Analysis, Inc., Menlo Park, Calif EVALUATING R AND D OPTIONS UNDER UNCERTAINTY. VOLUME 2: ATMOSPHERIC FLUIDIZED-BED COMBUSTION COMMERCIALIZATION STRATEGIES Final Report A B Borison, B R Judd, P A Morris, and E C Walters Aug 1981 79 p Sponsored by Electric Power Research Inst (EPRI Proj. 1432-1)

(DE81-904246, EPRI-EA-1964-Vol-2) Avail. NTIS HC A05/MF A01

A quantitative framework for analyzing commercialization decisions for emerging electrical power generation technologies was developed. The framework addresses the general question of when to freeze a design for commercialization. The framework was developed to help evaluate the benefits of continuing the development of two different designs for atmospheric fluidized bed combustion boilers. EPRI staff participated actively in specifying the scope of the analysis and in providing technical information on the two designs. The framework was demonstrated using this information, supplemented with probabilistic judgments by EPRI staff about possible outcomes from the pilot and demonstration stages of development. Based on the technical

data and judgments supplied by EPRI staff, the analysis shows a net benefit for proceeding with the development of two designs

N82-16013# Applied Decision Analysis, Inc., Menlo Park, Calif EVALUATING R AND D OPTIONS UNDER UNCERTAINTY. VOLUME 3: AN ELECTRIC-UTILITY GENERATION-EXPANSION PLANNING MODEL Final Report

A B Bonson, B R Judd, P A Morris, and E C Walters Aug 1981 114 p refs Sponsored by Electric Power Research Inst

(EPRI Proj. 1432-1)

(DE81-904237, EPRI-EA-1964-Vol-3) Avail NTIS

HC A06/MF A01

An electric utility generation expansion model developed for use in research and development (R and D) planning under uncertainty is described. The model provides a framework for examining broad utility and R and D planning issues, rather than the specific generation expansion decisions of individual utilities. Unlike existing approaches, the model focuses directly on the demand, technological, and regulatory uncertainties and the long term dynamics that affect the impact of R and D achievements. The model's somewhat aggregate approach to electric utility decision making (to allow repeated application at low cost) can be modified, as needed, for more detailed utility planning. When fully implemented, the model can be applied to the analysis of issues such as technology adoption, reserve margin, unit size, reliability, storage and load management effects, lead time, and government regulation.

N82-16014# Brookhaven National Lab, Upton, N Y APPLICATION OF AN LP MODEL TO STRATEGIC PLANNING OF MULTINATIONAL COOPERATIVE RD AND D PROGRAMS

V L. Sailor 1981 10 p refs (Contract DE-AC02-76CH-00016)

(DE81-029325, BNL-29857) Avail NTIS HC A02/MF A01 An analytical study was initiated to serve as a basis for defining a cooperative strategy for RD and D among International Energy Agency member nations A flexible energy system model, MARKAL, was developed as the primary tool for the analysis The flexibility of MARKAL is demonstrated by the fact that the diverse energy systems of sixteen countries and the aggregated European Economic Community have been modeled successfully MARKAL is a multi-period linear programming model which describes the energy flows, costs, and resource consumption of national energy systems over an extended period of time (1980 to 2020) Various policy options and assumptions about future world situations create a range of scenarios which control the MARKAL solutions Such options and such postulated conditions, translated into operational indicators to drive the MARKAL model and constrain its solutions, are described

N82-16022*# National Aeronautics and Space Administration. Washington, D C

AERONAUTICS AND SPACE REPORT OF THE PRESIDENT.
1980 ACTIVITIES

1981 108 p

(NASA-TM-84079) Avail NTIS HC A06/MF A01 CSCL 05A

The year's achievements in the areas of communication, Earth resources, environment, space sciences, transportation, and space energy are summarized and current and planned activities in these areas at the various departments and agencies of the Federal Government are summarized Tables show U S and world spacecraft records, spacecraft launchings for 1980, and scientific payload and probes launched 1975-1980 Budget data are included.

Includes solar collectors, solar cells, solar heating and cooling systems, and solar generators

A82-10007 Solar materials science. Edited by L. E. Murr (New Mexico Institute of Mining and Technology, Socorro, NM). New York, Academic Press, 1980, 799 p. \$35

Solar collector (photothermal) materials are considered, taking into account the optical properties-microstructure relationship in particulate media, solar mirror materials and their use in solar concentrating collectors, the effect of soiling on solar mirrors and techniques used to maintain high reflectivity, the emissivity of metals, fundamental limits to the spectral selectivity of composite materials, composite film selective absorbers, and corrosion science and its application to solar thermal energy material problems. Solar storage and thermochemical materials are discussed, giving attention to thermal storage in salt-hydrates, a thermodynamic basis for selecting heat storage materials, the application of reversible chemical reactions to solar thermal energy systems and materials science issues encountered during the development of thermochemical concepts. Solar conversion (photovoltaic) materials are also examined, and a description is provided of research and device problems in photovoltaics, heterojunctions for thin film solar cells, the optimization of solar conversion devices, and the basic aspects of plasmadeposited amorphous semiconductor alloys in photovoltaic conversion. The role of crystal defects in solar materials is studied along with surface and interface characteristics.

A82-10008 Introduction to solar materials science. R S. Claassen (Sandia Laboratories, Albuquerque, NM) and B. L. Butler (Solar Energy Research Institute, Golden, CO). In Solar materials science. New York, Academic Press, 1980, p. 3-51. 38 refs. Contracts No. DE-AC04-76DP-00789, No EG-77-C-01-4042

A broad program is underway to develop and improve the full range of technologies needed to make solar energy a significant contributor to the U.S. national energy supply. One important aspect of the technology development is materials. Attention is given to solar collector materials, photochemical conversion and storage, and solar conversion materials. Although solar energy systems require no fuel, they are characterized by high initial cost. Cost reduction is, therefore, an essential element of the solar energy program. Concern for cost is reflected in considerations of materials availability, in the development and demonstration of mass production processes which are inherently inexpensive, and in the design of solar energy systems of minimum complexity.

G.R.

A82-10009 Introduction to the role of crystal defects in solar materials. L. E. Murr and O. T. Inal (New Mexico Institute of Mining and Technology, Socorro, NM). In Solar materials science.

New York, Academic Press, 1980, p. 53-92. 33

It is pointed out that, to a large extent, the science of materials is dominated by the role of imperfections in determining or controlling the properties of materials. Crystal defects, or imperfections, in crystalline materials are now well documented. In general, they are grouped into regimes of zero-dimensional (or point) defects, one-dimensional (or line) defects, two-dimensional (or planar) defects, and three-dimensional (or volume) defects. Vacancies, interstitials, and substitutional impurities constitute the more common point defects, while charge balance requirements in ionic solids require pairs of such defects to be formed, or some other charge-compensating mechanisms. Dislocations constitute the more common line defects. Attention is given to crystal structures and order-disorder phenomena, crystal lattice defects, and solar-related materials structures.

G.R.

A82-10010 Surface and interface studies and the stability of solid solar energy materials. A W. Czanderna (Solar Energy

Research Institute, Golden, CO). In Solar materials science.
New York, Academic Press, 1980, p 93-147 61 refs.
Contract No EG-77-C-01-4042.

An overview is provided of the role that surface and interface studies of solid materials must play if the U.S is to achieve wide scale commercialization and application of the various solar technologies. Surface studies applicable to solar materials are considered, taking into account the surface area, real and clean surfaces, structure and topography, surface composition or purity, surface thermodynamics, the equilibrium shape, diffusion, the nature of adsorbate/solid interactions and the amount adsorbed, and the methods used for studying the surfaces of solar materials. The surface science of solar materials surfaces is discussed, giving attention to surface science in energy technologies, areas of surface science and solar energy technologies, and surface science applied to specific solar energy materials. A description is presented of the role of the polypropylene/copper oxide interface in the catalyzed oxidative degradation of polypropylene.

G.R.

A82-10011 The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers. A Ignatiev (Houston, University, Houston, TX) In Solar materials science. New York, Academic Press, 1980, p. 151-170 28 refs. Research sponsored by the U.S. Department of Energy and University of Houston

The basic principles of electromagnetic radiation absorption in solids are examined. It is found that a good solar energy absorber should have a metallic or semimetallic component and that the absorber should be composed of small particles. The understanding of the interaction of an array of small conducting particles with electromagnetic radiation is, in this connection, of interest in the study of solar energy absorption. An effective medium theory is considered. The approach used by O'Neill and Ignatiev (1978) is expanded to illustrate the applicability of an approach which involves the definition of distributions of spheroidal particles in the modeling of the optical response of particulate films. The investigation shows that the optical response of solar absorbers is strongly dependent on the microscopic structure of the absorber. It is, therefore, possible to accomplish optical tailoring of a material through the manipulation of its microscopic structure.

A82-10012 Solar mirror materials - Their properties and uses in solar concentrating collectors. R. B Pettit and E. P Roth (Sandia Laboratories, Albuquerque, NM) In Solar materials science. New York, Academic Press, 1980, p. 171-197. 32 refs. Contract No. DE-AC04-76DP-00789

Solar mirror materials are used in a variety of solar collectors in order to redirect the incident sunlight onto a receiver surface. The collectors employed range from augmented flat plate collectors to high concentration tracking parabolic dish concentrators. The primary advantage in using solar mirrors to concentrate sunlight is either to increase the system efficiency (e.g., be reducing thermal losses) or to reduce the system cost where relatively expensive receiver materials are utilized. In most applications, the total mirror surface area deployed is large. Thus, the mirrors must be manufactured at a relatively low cost. The current state of mirror materials with application to solar concentrators is reviewed. After specular reflectance is defined, the optic "measurement techniques developed specifically for these materials are discussed. Attention is given to the solar reflectance properties of mirror materials, taking into account glass, metallized plastics, polished aluminum, and protective coatings.

A82-10013 The effect of soiling on solar mirrors and techniques used to maintain high reflectivity. E P. Roth and R. B. Pettit (Sandia Laboratories, Albuquerque, NM) In Solar materials science. New York, Academic Press, 1980, p. 199-227, 24 refs. Contract No. DE-AC04-76DP-00789.

Solar mirrors are designed to achieve initially the maximum possible reflectance. However, outdoor exposure subjects the mirror materials to environmental conditions which can quickly reduce their efficiency. One effect of outdoor exposure is the reflectance loss due to the accumulation of foreign particles on the mirror surface. Specular reflectance losses as great as 25% have been observed for mirrors exposed for only a few weeks. Severe energy losses can occur in the case of concentrating collecting systems. Thus, from an

economic point of view, periodic cleaning or reduction of soil accumulation is a practical necessity. Potential methods for controlling the reflectance loss due to soiling must be based on information regarding dust accumulation and its effect on the produced energy. A field test study was initiated simulating some of the operational configurations of solar mirrors to obtain a suitable data base. The accumulation of dust and the resulting loss in specular reflectance was found to be a complex function of mirror material, weather conditions, geographical location, and operational methods.

A82-10014 The emissivity of metals. A. J. Sievers (Cornell University, Ithaca, NY). In Solar materials science.

New York, Academic Press, 1980, p. 229-254, 29 refs.

NSF Grant No. DMR-76-81083; Contract No. XH9-8158-1.

It is pointed out that the high-temperature thermal radiative properties of metals were not described correctly until 1978. The early radiant heat transfer models of metals are examined, taking into account model characteristics which do not correspond to the real physical conditions. A description is given of a new model, which describes correctly the temperature-dependent thermal radiative properties of metals. Attention is given to the temperature dependence of the hemispherical emissivity of platinum, high-temperature selective surfaces, aspects of spectral emissivity, questions of total emissivity, the normal spectral emissivity of the Drudy free electron model as a function of frequency, and model corrections. For a correct description of the infrared emissivity of metals, it is necessary to take into account the properties of metals surfaces.

G.R.

A82-10015 Fundamental limits to the spectral selectivity of composite materials. A J. Sievers (Cornell University, Ithaca, NY). In Solar materials science New York, Academic Press, 1980, p. 255-276. 18 refs. NSF Grant No DMR-76-81083, Contract No. XH9-8158-1

Two approaches are considered for absorbing the solar radiation, while suppressing thermal reradiation. According to one approach, the solar radiation is transmitted through a heat mirror to a nonselective absorber. The second approach involves the absorption of solar radiation by a dark mirror which has a small thermal emissivity. The construction of the employed spectrally selective surfaces is very different for each case. The current study is concerned with the relative potential of each of the two approaches, taking into account in both cases the best configuration consistent with physical constraints. Transparent heat mirrors are considered, taking into account the spectral characteristics of conducting meshes. In an investigation of dark mirrors, attention is given to dark metal, metal plus a dielectric film, and metal plus an absorbing film. The relative merits of the two considered approaches depend upon the temperature. Should selective absorber temperatures ever rise above 800 K, the heat mirror may ultimately provide the larger figure of merit. GR

A82-10016 Composite film selective-absorbers. R. A. Buhrman and H. G. Craighead (Cornell University, Ithaca, NY). In Solar materials science. New York, Academic Press, 1980, p. 277-317. 17 refs. Research supported by the Solar Energy Research Institute.

A description is presented of the general nature of the optical properties of metal-insulator composite films. Attention is given to the production of composites, the composite microstructure, the Maxwell-Garnett theory, an alternative mean field theory first proposed by Bruggeman (1935), and optical properties observed in experimental studies. Approaches employed to develop a surface which is strongly absorbing over the solar spectrum but nonabsorbing at longer wavelengths are discussed. Figures of merit are considered along with questions regarding the choice of composite absorber components, graded composition coatings, and the production of high temperature selective absorbers.

A82-10017 Corrosion science and its application to solar thermal energy material problems. S. L. Pohlman (Solar Energy Research Institute, Golden, CO). In: Solar materials science.

New York, Academic Press, 1980, p. 319-373. 53 refs Contract No. EG-77-C-01-4042 Attention is given to problems that may limit the development of solar thermal systems due to material failure. Material degradation in one form or another appears to be a common problem facing the development of solar thermal power. An investigation is conducted of material problems of thermal concentrating systems that employ gas, liquid metal, molten salt, water, or organic fluids as a primary heat transfer fluid Degradation of the reflective surfaces used to concentrate thermal energy is also considered, and material problems associated with thermal storage are discussed. A review of flat plate collector systems is conducted, and the material problems facing ocean thermal conversion systems are examined By the application of thermodynamic data, environmental observations, and electrochemical measurements, chemical and mathematical models of corrosion processes can be developed and used to effectively predict corrosion failure.

A82-10020 The application of reversible chemical reactions to solar thermal energy systems. R. Mar (Sandia Laboratories, Livermore, CA). In: Solar materials science New York, Academic Press, 1980, p. 439-457. 33 refs.

It has been proposed to use reversible thermochemical reactions as a means for storing thermal energy in solar energy systems. The considered approach involves the storage of thermal energy in the form of chemicals created by endothermic reactions. In addition to the storage applications, there is also interest in applying reversible reactions to solar thermal energy transport and solar thermal heat pumping for space heating and cooling systems. A review is provided of all three of these applications. The characteristic features of reversible chemical reaction systems are compared to the properties of sensible and latent heat systems. Preliminary cost/benefit studies show that of the three applications considered solar chemical heat pump systems for space heating and cooling applications are the most attractive. The use of thermochemical reactions strictly for thermal energy storage in solar thermal electric power plants does not appear to be attractive.

G.R.

A82-10021 Materials science issues encountered during the development of thermochemical concepts. R. Mar (Sandia Laboratories, Livermore, CA). In: Solar materials science

New York, Academic Press, 1980, p. 459-485. 27 refs. Thermodynamic considerations are to be used for a preliminary screening of reactions for solar energy applications. Attention is given to relations involving the reaction temperature, coupled reaction considerations, and entropy considerations. Reactions which meet the thermodynamic requirements must be evaluated further with respect to technical and economic feasibility. Generic materials problems are examined, taking into account catalyzed reactions, thermal decomposition reactions, and solution-dissolution reactions. Aspects of materials corrosion and compatibility are also discussed along with catalyst development activities. Concerns with catalyzed reaction systems are found to include effects of thermal cycling on reactor materials, catalyst availability and lifetime, and undesirable side reactions. Problems have arisen in thermal decomposition systems due to poor or variable kinetics and volume expansion effects. Reactions which make use of the heat of solution suffer least from materials problems. The major concerns are with the corrosive nature of the chemicals involved.

A82-10022 Introduction to photovoltaics - Physics, materials and technology. L. Kazmerski (Solar Energy Research Institute, Golden, CO). In Solar materials science New York, Academic Press, 1980, p. 489-549. 302 refs.

The operational principles and performances of photovoltaic solar cells based on various materials are reviewed. Following a brief introduction to the possible structures and categories of solar cells and the rationale for the development of improved, low-cost variants to the conventional single-crystal Si cell the current-voltage characteristics of a homojunction cell are derived from the materials properties of the device, and the efficiency and equivalent circuits for the device are discussed. The material properties necessary to the functioning of a photovoltaic device are examined, with attention given to the energy gap, absorption coefficient, diffusion length, minority carrier lifetime, doping, surface recombination, and gap state density. Examples of device and materials engineering are presented which illustrate the advancement of solar cell technology.

A L.W.

A82-10023 Research and device problems in photovoltaics, L. Kazmerski (Solar Energy Research Institute, Golden, CO). In: Solar materials science. New York, Academic Press, 1980, p. 551-584, 96 refs.

Current problems in photovoltaic device research are reviewed as they relate to intermediate-efficiency thin-film solar cells and high-efficiency concentrator devices. In the area of thin-film solar cells, efforts have been centered on the improvement of materials and device properties for devices based on amorphous silicon, polycrystalline silicon, thin-film GaAs, and CdS, with emphasis on problems associated with the grain boundaries and degradation mechanisms, and on the identification and demonstration of new photovoltaic materials including InP, CdTe, Cu2O, Zn3P2, Cu2Se, ZnSiAs2, CdSiAs2, BAs and polyacetylene. Devices under development for high-efficiency solar concentrators include the multidevice, beam-splitting photovoltaic convertors, monolithic multijunction solar cells, and the edge multiple vertical junction device. A.L.W.

A82-10024 Heterojunctions for thin film solar cells. R. H. Bube (Stanford University, Stanford, CA). In: Solar materials science. New York, Academic Press, 1980, p. 585-618. 33 refs. Research supported by the U.S. Department of Energy and Solar Energy Research Institute.

The basic properties of semiconductor heterojunctions and heteroface junctions are discussed in relation to their use in solar cells. The types of measurements that are used in the characterization of an experimental heterojunction cell are considered, including measurements of the bulk properties of the component materials, the crystallographic structure of component materials, the effects of surface treatments on material properties, contact resistivities, dark and light current-voltage characteristics, light diode parameters, the spectral dependence of quantum efficiency, reverse breakdown voltage, the light intensity dependence of cell parameters, junction capacitance, electron-beam induced current, photoluminescence and electroluminescence, chemical composition and interface structure Band diagrams are then presented for heterojunctions composed of a highly conducting p-type optical absorbing window material and a highly conducting n-type window material on a less conducting p-type absorber, which are illustrated by the Cu2S/CdS and CdS/CdTe heterojunctions, respectively. The fabrication and characteristics of CdS/CdTe, CdS/InP, and ZnO/CdTe heterojunctions, MIS and SIS devices, and sputtered ITO/CdTe and ITO/InP buried homojunctions are then examined in detail A.L.W.

A82-10025 The optimization of solar conversion devices. D. S. Ginley, M. A. Butler, and C. H. Seager (Sandia Laboratories, Albuquerque, NM). In Solar materials science.

New York, Academic Press, 1980, p. 619-664, 40 refs. Contract No. DE-AC04-76DP-00789.

The direct and indirect application of simple chemical potential and electronegativity arguments to photoelectrochemical cells (PEC) and thin-film polycrystalline semiconductors - systems seen as having considerable potential for solar energy conversion - is discussed. It is shown how the principal criteria of the cells can be determined. Particular attention is given to the biasing requirements of these cells, and to this end an electronegativity model is presented that can be used to predict biasing requirements on a quantitative basis. Attention is also given to the energy levels in silicon grain boundaries and to the double-depletion-layer, thermal-emission model of conduction over the potential barrier in the boundary. Also discussed are recent results demonstrating that various chemical agents, when appropriately introduced into silicon grain boundaries, are capable of modifying grain boundary potential barriers.

C.R.

A82-10026 Introduction to basic aspects of plasmadeposited amorphous semiconductor alloys in photovoltaic conversion, R. W. Griffith (Brookhaven National Laboratory, Upton, NY). In Solar materials science. New York, Academic Press, 1980, p. 665-731. 75 refs. Research sponsored by the U.S. Department of Energy

The progress that has been made in advancing an understanding of the materials properties of plasma-deposited a-Si-H alloys is reviewed. The nature of the plasma is discussed, proceeding from preliminary concepts of the RF glow discharge to a more detailed description of the plasma chemistry in the silane glow discharge. Experience gained with plasma etching is briefly reviewed as a

paradigm for plasma deposition. Emitting reactive species that are identified in plasma deposition using optical emission spectroscopy are discussed, and electron-impact processes that are pertinent to the silane glow discharge are summarized. In addition, the characterization of plasma-deposited silicon-hydrogen alloys is analyzed. The introduction given to chemical bonding consists of discussions of short-range structural order, the role of hydrogen in the alloy, and the influence of residual gap states upon diode characteristics. C.R.

A82-10331 Alternative power sources for residential air-conditioning systems. J. Tiran (Negev, University, Beersheba, Israel). Applied Energy, vol. 9, Oct. 1981, p. 121-130. 8 refs.

An integrated system which utilizes three sources of energy for the purpose of air-conditioning a residential building is considered. The system includes a control unit which determines (according to a built-in programmed logic) which energy source is to be used. The system's three power provisions are: (1) line electricity, (2) electric power generated by an appropriate wind turbine and (3) a hot water system heated by solar collectors. System requirements and operation were simulated by a computer program which calculated the air-conditioning load and the energy provisions throughout a twenty-four hour period. In winter operation, about 68 per cent of the required heating was supplied by solar heating and 32 per cent by wind-generated power and in summer operation, in a typical day, all the required cooling energy was provided by wind-generated power.

(Author)

A82-10385 Prospects for the development of solar energy in the USSR - Production of electric power by thermodynamics methods. R. R. Aparisi, Iu. N. Malevskii, B. V. Tarnizhevskii, V. K. Gusev, and A. M. Karpenko (Gosudarstvennyi Nauchnolssledovatel'skii Energeticheskii Institut, Moscow, Teploelektroproekt, Sel'energoproekt, USSR) (Geliotekhnika, vol. 16, no. 6, 1980, p. 3-10.) Applied Solar Energy, vol. 16, no. 6, 1980, p. 1-8.6 refs. Translation.

Tower solar power plants, pumped storage to level off the intermittency of the energy source, and parabolic dish concentrators for low power users in the U.S.S.R. are discussed. Capital expenditures and energy efficiency of solar plants are composed with conventionally fueled power plants, deriving baseline economic parameters which justify solar plant construction. Initial plans are presented for the installation of 5 - 10 MW units in rural areas of low generating capacity remote from conventional fuel sources, using mirrors optimized at 25 sq m and equipped with automatic tracking systems. Plants in Kazakhstan are considered for powering deep well irrigation and desalinization of the mineral-rich water. The development of new energy storage capabilities is considered vital to successful introduction of large solar power plant capacities. M.S.K.

A82-10386 Some characteristics of silicon photocells fabricated by planar technology. C Tkhong, K. A. Tyan, P. V. Khoi, and L. K. Nam (National Center Branch for Scientific Research of Vietnam, Ho Chi Minh City, North Vietnam). (Geliotekhnika, vol. 16, no. 6, 1980, p. 18-21.) Applied Solar Energy, vol. 16, no. 6, 1980, p. 15-18. 8 refs. Translation.

It is reported that a method for determining the effective diffusion length on the basis of the spectral distribution curve for the collection coefficient permits a qualitative evaluation of the nonequilibrium distribution of recombination centers in the base layer.

(Author)

A82-10387 Present state of research on selective coatings for solar-energy converters. M. M. Koltun (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). (Geliotekhnika, vol. 16, no. 6, 1980, p. 34-42.) Applied Solar Energy, vol. 16, no. 6, 1980, p. 30-38. 42 refs. Translation

Recent developments in selective surface coatings for solar cells, flat plate and tubular collectors, and parabolic concentrators are reviewed. Solar cells treated with hydrazine hydrate or alkalies produce a surface with relief, which traps up to 97% of the spectrum. Multilayer cells transparent to the IR are noted for space applications, phosphor coatings to convert ultraviolet radiation to visible light are mentioned for use as light and radiation detectors, expanding the range into the 0.2-0.4 micron wavelengths. Coating compounds for cell protection are presented, noting a trend toward.

polymer films, silicon varnish, and coatings with microrelief to enhance cell efficiencies. Processes for electrochemical plating of thermal collector surfaces are listed, including black nickel and chrome, as are various reflective coatings for thermal radiators. The development of cermets for high IR transparency is discussed, noting that cermets extend the absorptance/emmissivity ratio to 60-65. Finally, tin oxides employed for solar cell antireflective coatings are observed to reduce surface recombination rates in silicon cells.

M.S.K

A82-10388 Investigation of abrasive action of atmospheric particles on the reflectance of mirrors. R A. Zakhidov and A. Ismanzhanov (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR) (Geliotekhnika, vol. 16, no. 6, 1980, p. 43-47.) Applied Solar Energy, vol. 16, no. 6, 1980, p. 39-43. 9 refs. Translation.

Atmospheric dust, its particle sizes, and wind-blown effects on solar power plant mirrors are investigated. Experiments were performed with particles from 5-200 microns at wind tunnel speeds of 2-30 m/s, encountering a protected or uncoated aluminum mirror Wind speed, mirror angle and dust size and concentration per volume air were varied and mirror reflectance, diffuse reflectance, rear reflection, and light transmission through various protective coatings were measured after 60 hrs bombardment. Damage was related to wind speed, with all dust sizes causing damage when wind exceeded 30 m/s. Mirror angles of 90 and 0 deg relative to the wind eliminated damage up to 30 M/s, and SiO2 coatings were found to offer protection up to a 30 deg angle. The experiments indicate that mountain-valley air circulation presents no danger to mirrors, whereas areas of frequent jet winds and loose soil do.

A82-10389 Experimental investigation of parabolic cylinder solar concentration with tubular heat receiver. M. A Markman, N. V. Kolomoets, L. M. Simanovskii, lu. I. Shmatok, and O. P. Zakharova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). (Geliotekhnika, vol. 16, no. 6, 1980, p. 66-68.) Applied Solar Energy, vol. 16, no. 6, 1980, p. 61-63 Translation.

The performance and characteristics of an electroplated anodized aluminum parabolic concentrator with a tubular heat receiver are described. A 2-sq-m sheet of aluminum was elastically deformed into a concentrator with a 400-mm focal length, the heat receiver was a blackened metal tube enclosed in a fluorescent light tube. Focusing errors were determined by use of a collimated light beam shone perpendicular to the receiver window, and optical efficiency and heat receiver losses were calculated and graphed as functions of temperature. The total flux was determined by calorimetry of water flowing through the receiver tube and by measuring the temperature of the heat receiver directly; predicted values for the flux agreed satisfactorily with the experimental findings.

M.S.K.

A82-10390 Regime characteristics of a solar thermoelectric generator and comparison of experimental and calculated data. E. A Movsumov and A. M. Bairamov (Kırovabadskıı Pedagogicheskıı Institut, Kırovabad, Azerbaidzhan SSR). (Geliotekhnika, vol. 16, no. 6, 1980, p. 69, 70) Applied Solar Energy, vol. 16, no. 6, 1980, p. 64-66. 7 refs. Translation.

Experiments undertaken to verify predicted solar thermoelectric generator performance are described. The powder metallurgy process for production of Bi-Te-Se-negative and Bi-Te-Sb positive legs of the thermoelectric generator is reviewed, as is the fabrication of the generator, illuminance, varied according to flux data from the Azerbaidzhan SSR, was provided by a searchlight with a focal-spot maximum heat of 300 C. Volt-ampere characteristics of the thermopiles were determined for various temperature differentials, and the efficiencies were calculated. Both capacity and efficiency were found to rise linearly with increasing temperature. Performances determined from simulation of three actual 12-hour periods agreed well with predicted values

M.S.K.

A82-10391 Electrical characteristics of high-voltage germanium photoconverters under high illumination intensities. D. S. Strebkov, V A Tikhomirova, and G. B. Fedosova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR) (Geliotekhnika, vol. 16, no. 6, 1980, p. 71-73.) Applied

Solar Energy, vol 16, no. 6, 1980, p 67-69. 6 refs. Translation

Germanium matrix photoelectric cells were tested in 0.1-5 W/ sq cm illumination to characterize their electric properties. Cell specimens were moved along the optical axis of a Fresnel lens under 600 Willumination to vary the light intensity, and output was compared with a linearly varying short-circuit current of a standard silicon cell. Examination of volt-ampere characteristics revealed that low resistance (0.1 ohm cm) germanium cells displayed a linear photocurrent dependence over the illuminance range explored, while higher resistivity (10 ohm cm) produced nonlinear behavior at around 3 W/sq cm and upward The behavior is attributed to a voltage drop in the base region of the cell. Efficiency was found to reach a maximum at 1 W/sq cm, falling off thereafter A 6 5% maximum efficiency was found for 10 ohm cm germanium cells.

A82-10467 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence. R. T. Kıvaisi (Institute of Optical Research, Stockholm, Sweden). Solar Energy Materials, vol. 5, Aug 1981, p. 115-127 23 refs.

Optical properties of chromium films deposited at oblique angles of incidence are studied, and consideration is given to their being used as selective films in photothermal solar energy conversion. The films were produced on smooth glass substrates by subliming chromium pellets from an electron beam gun in a conventional oil diffusion pumped system in high vacuum. A graphical relationship between film thickness and reflectance was obtained, and coatings with the desired selectivity were produced. Some films were deposited on nickel and aluminum metal backing. A near to zero reflectance (0.9 microns) of a film coated on an aluminum substrate corresponded to a film thickness of 110 nm, the coating having a solar absorptance of about 86%. It is thought that the coating contains a high concentration of metal grains, each surrounded by a very thin film of chromium oxide. It is concluded that the emissivity of the surfaces is primarily determined by the base metal.

A82-10468 Spectrally selective copper sulphide coatings. S. B. Gadgil, R. Thangaraj, J. V. Iyer, A. K. Sharma, B. K. Gupta, and O. P. Agnihotri (Indian Institute of Technology, New Delhi, India). Solar Energy Materials, vol. 5, Aug. 1981, p. 129-140. 9 refs Research supported by the Tata Energy Research Institute.

Copper sulfide films are chemically deposited on aluminum substrates in ambient air by chemical spray deposition, and their optical properties are studied for their application in solar energy photothermal conversion. The experimental procedure is described, including the deposition technique, structural studies (using an X-ray diffractometer and a transmission electron microscope), stagnation temperature measurements, and aging tests. It is shown that (1) the solar absorptance and solar emittance of the films do not change after cycling between 0 and 200 C, and (2) the films withstand temperatures as high as 200 C for more than 500 h. Solar selectivity with maximum solar absorptance (0.89) and minimum thermal emittance (0.25) is obtained for a film deposited at 250 C with a volume ratio of 1.1 of thiourea and cupric acetate solutions, and a thickness of 1.6 microns. It is concluded that the films provide a low cost (\$2.5/sq m) selective coating for photothermal conversion of solar energy.

A82-10469 Effect of metal base layer on the absorptance and emittance of sputtered graded metal-carbon selective absorbing surfaces. G. L. Harding and S. Craig (Sydney, University, Sydney, Australia). Solar Energy Materials, vol. 5, Aug. 1981, p. 149-157. 17 refs. Research supported by the University of Sydney.

Solar absorptance and temperature-dependent emittance is measured for graded metal-carbon films deposited onto smooth aluminum, copper, nickel, and stainless steel base layers, sputter-deposited onto glass tubes at relatively low argon pressure (approximately 0.5 Pa), and deposited onto textured copper using argon pressures 3 to 40 Pa. Absorptance measurements are made on surfaces deposited onto small plane glass slides attached to a glass tube in the coating system, and emittance measurements are made on coated tubes, assembled into glass envelopes. Both the small planar specimens of selective surface and coated tubes were inserted in continuously evacuated glass envelopes and annealed at 500 C for approximately 1 hr. It is shown that solar absorptance varies by only 1-2% for the different base layers, whereas the emittance of surfaces based on nickel and stainless steel is considerably higher than for

surfaces based on copper and aluminum. Small changes occur in absorptances and emittances after annealing. It is concluded that the optimum selective surface for evacuated collectors used with mirrors of low concentrations consists of graded metal-carbon overlaid with smooth copper.

K.S.

A82-10471 Production of alloys of bismuth telluride for solar thermoelectric generators. T. Durst, H. J. Goldsmid, and L. B. Harris (New South Wales, University, Kensington, Australia). Solar Energy Materials, vol. 5, Aug. 1981, p. 181-186. 9 refs

A simple and inexpensive method is described for the preparation of sintered thermoelements for use up to about 200 C, i.e., within the temperature range that is accessible using nontracking solar collectors. The method involves selecting the raw materials, weighing the constituents and melting the ingots, grinding and grading the powders, cold-pressing the thermoelements, sintering, and evaluating the thermoelectric properties. It is shown that p-type Bi(0.5)Sb(1.5)Te(3) containing 0.05% atomic Pb, and n-type B(2)Te(27)Se(03) containing 0.2% atomic S are most suitable for operation between 30 and 170 C (i.e., at a mean temperature of 100 C). The Seebeck coefficient, electrical conductivity, and figure of merit are measured between 15 and 200 C using apparatus based on Harman's technique (1958), account being taken of radiation losses It is shown that even though the thermoelements are porous, their thermoelectric figures of merit compare well with the values obtained with hot-pressed material of higher density. Thermoelements prepared by the method described have been fitted into a solar generator which has been operated for six months without any signs of aging.

A82-10472 Solution grown PbS/CdS multilayer stacks as selective absorbers. G B. Reddy, V Dutta, D. K. Pandya, and K. L. Chopra (Indian Institute of Technology, New Delhi, India) Solar Energy Materials, vol 5, Aug. 1981, p 187-197. 16 refs.

Theoretical and experimental studies are reported for the design and fabrication of multilayer stacks for selective solar absorbers (25 x 25 sq cm) of PbS and CdSm made on Ni coated Cu and stainless steel, using a solution grown technique. A mathematical model is formulated using the matrix multiplication method to calculate the reflectance of the absorbers. The preparation technique involves dissociating thiourea in an alkaline solution containing Pb or Cb salts, as reported by Sharma et al. (1976) and Kaur et al. (1980). The best values of solar absorptance and thermal emittance obtained are 0.92 and 0.12, respectively, which is in close agreement with the estimated values. Coatings with as many as six alternate layers of PbS and CdS have been made.

A82-10658 Numerical simulation of solar cell open circuit voltage decay. L Castañer, J. Llaberia, J. Garrido, and E Vilamajó (Barcelona, Universidad Politécnica, Barcelona, Spain) Electronics Letters, vol 17, Oct. 1, 1981, p. 745-747. 8 refs

A82-10776
Laser bonded n-GaAs/p-GaSb heterojunction intercell Ohmic contact. H T Yang and S W Zehr (Rockwell International Microelectronics Research and Development Center, Thousand Oaks, CA). Applied Physics Letters, vol 39, Oct. 15, 1981, p. 634-636 7 refs. Contract No. XS9-8058-2

A method is described for forming an n-GaAs/p-GaSb heterojunction intercell Ohmic contact by a pulsed Nd glass laser (1.06 micron wavelength) bonding procedure. High quality subcell assemblies of appropriate band-gap are fabricated individually and are used to form a metallurgical bond. The method avoids the need of total lattice matching throughout the structure of a stacked multicolor solar converter.

A82-10810 Boiling flow instability of a fixed mirror distributed focus solar receiver. S M. Cho, L. D Clements, J D Reichert (Texas Tech University, Lubbock, TX), and T T. Kao (American Institute of Chemical Engineers and American Society of Mechanical Engineers, National Heat Transfer Conference, 20th, Milwaukee, WI, Aug. 2-5, 1981.) AIChE Symposium Series, vol 77, no. 208, 1981, p. 302-311 10 refs Contract No. EY-76-C-04-3737.

A fixed mirror distributed focus (FMDF) solar thermal electric power plant concept has been developed. The FMDF system consists

of fixed spherical mirror arrays (collector), movable receiver (boiler), receiver support and two-axis gimballing mechanisms, auxiliary heat storage system, and turbine-generator equipment. The FMDF concept has been adopted for a five(5)-MWe solar gridiron project for the city of Crosbyton, Texas A review is provided of the basic, steady-state, thermal hydraulic performance characteristics of the FMDF receiver. Two types of boiling flow instability are considered, including a static instability and a dynamic instability Approaches for stabilizing unstable boiling flow are also considered, taking into account the use of variable ID tubes and the employment of intermediary plenums in the boiling circuit.

A82-10836 # Optical degradation of antireflective silica film on solar collector windows. C. T. Solaga (Commonwealth Scientific and Industrial Research Organization, Div. of Mineral Chemistry, Port Melbourne, Victoria, Australia) Applied Optics, vol. 20, Oct. 15, 1981, p. 3464, 3465. 6 refs

It is reported that a sustained accumulation of contaminants on antireflective silica film-coated solar collector glass could lead to increased reflection losses that could be deleterious to collector efficiency, particularly in environments with high atmospheric pollution levels Infrared absorption studies of the eluted material have demonstrated that the change in reflectance of the coated surface is caused, for the most part, by adsorption of airborne contaminants onto the negatively charged, high specific area presented by the close-packed, 10-20 nm diam silica spheres forming the antireflective film

A82-10969 # AAI Corporation receiver design experience in concentrating solar collectors. H A Wilkening, Jr (AAI Corp., Baltimore, MD) American Society of Mechanical Engineers, Joint Pressure Vessels and Piping, Materials, Nuclear Engineering and Solar Conference, Denver, CO, June 21-25, 1981, Paper 81-Sol-1 5 p Members, \$2.00, nonmembers, \$4.00

The design of concentrating solar collectors requires careful attention to the receiver if maximum theoretical efficiencies are to be achieved. Innovative design concepts and detailed analysis are required if the design goals are to be met at a reasonable cost. This paper examines typical design parameters and shows how they relate to actual field tested hardware. Design criteria such as producibility, selective coating, and absorber material, are discussed Several practical applications are then examined in detail. Operational experience of both tracking and fixed receivers is reviewed. The applications discussed are industrial hot water and heating and cooling. The special problems of combined photovoltaic and thermal receivers are included (Author)

A82-10970 # Development of a solar thermal central heat receiver using molten salt. T. R. Tracey (Martin Marietta Aerospace, Denver, CO). American Society of Mechanical Engineers, Joint Pressure Vessels and Piping, Materials, Nuclear Engineering and Solar Conference, Denver, CO, June 21-25, 1981, Paper 81-Sol-2 4 p. Members, \$2.00, nonmembers, \$4.00 Research supported by the US Department of Energy

The development and test of a 5 MWth solar heat receiver using a molten nitrate salt (60 percent NaNO3, 40 percent KNaNO3) as the heat transfer fluid is described. The application of the receiver concept in a central receiver solar power system is explained. The advantages of using molten nitrate salts as the receiver heat transfer fluid and the storage fluid are discussed. The problems associated with the receiver development including the need for high temperatures and combinations of creep and fatigue in the receiver tubes are discussed. Our approach to scaling from the 5 MWth test receiver to commercial receivers in the range of 200 MWth to 500 MWth is defined. The 5 MWth test system is described including the instrumentation used. The test facility which has a 60 m tower and 222 heliostats is described. The test results are presented. The receiver was in test for 500 hr at temperature and heat flux levels expected in commercial receiver systems (Author)

A82-10971 # Testing of the U.S. Solar Pilot Plant receiver. G C Coleman (McDonnell Douglas Corp., Huntington Beach, CA) and J M Friefeld (Rockwell International Corp., Canoga Park, CA) American Society of Mechanical Engineers, Joint Pressure Vessels and Piping, Materials, Nuclear Engineering and Solar Conference,

Denver, CO, June 21-25, 1981, Paper 81-Sol-3. 4 p Members, \$2.00, nonmembers, \$4.00

Preconstruction tests were conducted of the external, single-pass-to-superheat water/steam receiver of the U.S. DOE Solar Thermal Pilot Plant at Barstow, CA under actual solar operating conditions in order to validate the design at the earliest possible date. Receiver steady-state and transient operating characteristics and performance were investigated under three different conditions (1) clear day, (2) intermittent cloud, and (3) a simulated emergency situation. The testing program was concluded with limited testing of the receiver at flux and power levels above the maximum expected operating conditions. Attention is given to boiler temperature control, lateral flux gradients, panel tube thermodynamics, and dynamic flow stability.

A82-10972 # The development and design of steam/water solar receivers for commercial application. O. W Durrant, T. J. Capozzi, and R. H Best (Babcock and Wilcox Co, Barberton, OH). American Society of Mechanical Engineers, Joint Pressure Vessels and Piping, Materials, Nuclear Engineering and Solar Conference, Denver, CO, June 21-25, 1981, Paper 81-Sol-4. 11 p 7 refs Members, \$2.00, nonmembers, \$4.00.

A steam/water solar receiver is described which is designed in sectionalized form, with modularized components, so that it may be assembled in various sizes, capacities and geometries to meet the specific requirements of a system and the characteristics of the solar collector field. Special design features are incorporated to overcome the lack of balance in north-to-south field flux ratios, the effect of partial and transient cloud patterns, and a large number of thermal cycles. A parametric study aimed at the determination of the maximum allowable heat flux on the heat transfer surface components is also described. Attention is given to such aspects of the design as the screen tubes, and calculations and analyses are included for pressure and thermal stresses, heat transfer surface structure, acceptance criteria, and the effects of cloud cover.

A82-10973 # Conceptual design of an advanced water/steam receiver for a solar thermal central power system. S F Wu, T V Narayanan (Foster Wheeler Development Corp., Livingston, NJ), and D N. Gorman (ARCO Ventures Co., Denver, CO) American Society of Mechanical Engineers, Joint Pressure Vessels and Piping, Materials, Nuclear Engineering and Solar Conference, Denver, CO, June 21-25, 1981, Paper 81-Sol-5. 9 p 5 refs. Members, \$2.00, nonmembers, \$4 00. Research supported by the U.S. Department of Energy

This paper describes the conceptual design of an advanced water/steam receiver for a commercial-scale solar central receiver thermal power system. The objective was to develop a receiver concept featuring an optimum combination of cost, performance, and reliability. While interfaces with other major subsystems of the complete power plant were recognized, emphasis was on the design and performance of the receiver. The baseline thermal rating of this receiver was 550 MW, and the steam outlet conditions were 12,860 kPa and 516 C. After technical and economic evaluations, a quad-cavity, natural-circulation concept was selected as the preferred receiver design. It consists of four separate cavities in a single receiver unit, each cavity receiving concentrated solar energy from one quadrant of a surrounding heliostat field. (Author)

A82-11185 Carrier-collection efficiencies in amorphous hydrogenated silicon Schottky-barrier solar cells. P Viktorovitch, G. Moddel, J. Blake, and W. Paul (Harvard University, Cambridge, MA). Journal of Applied Physics, vol 52, Oct. 1981, p. 6203-6207. 28 refs. Contracts No. EG-77-C-01-4042; No. N00014-75-C-0648.

Correlations are studied in the collection efficiency, collection length, depletion width, and midgap density of states and energy-band gaps in sputter and silane-decomposition-produced amorphous hydrogenated silicon Schottky diodes Collection efficiency is controlled by field associated diffusion of carriers and the depletion region, and midgap-state density decreases with preparation-condition variations to produce wider bandgaps. Sputter-produced films have a collection length which is less than the depletion width, and films produced from the plasma decomposition of silane exhibit a smaller-state density for a given bandgap and a collection length equal to the depletion width. In addition, the weak variation of the deduced hole mobility lifetime product with midgap state density

and temperature is consistent with holes immobilized before recombing.

D.L.G.

A82-11187 Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells. T. Suda and R. H. Bube (Stanford University, Stanford, CA). *Journal of Applied Physics*, vol 52, Oct 1981, p. 6218-6223 20 refs. Research supported by the U.S. Department of Energy and Japan International Cooperation Agency.

A technique for infrared quenching of photocapacitance (PHCAP-IR) is used to investigate deep Cu-acceptor levels in Cu(x)S/CdS solar cells prepared by both wet and dry methods on CdS single crystals. A theory is developed which describes a doping profile and PHCAP-IR quenching to obtain energy levels, photoionization cross sections, and concentration profiles of Cu levels in CdS. Two transitions of 1.08 and 0.86 eV are measured at room temperature, and the photocapacitance quenching level of 0.86 eV is found to disappear at low temperatures. Spectral distributions of photoionization cross sections are obtained at a peak value of 1.1 x 10 to the -16th sq cm, and the doping profile of Cu indicates that a density of Cu up to one-half of the majority-carrier density diffuses into CdS after heat treatments at 200 C for a few minutes.

A82-11189 Vertical solar cell and internal electric field. Y.-T. Tang (National Tsinghua University, Hsinchu, Republic of China) Journal of Applied Physics, vol. 52, Oct. 1981, p. 6347-6351. 17 refs.

A method for estimating the pattern of the built-in electric field distribution in a vertical solar cell is developed that relies on the fact that a vertical solar cell responds differently to different monochromatic light. The usefulness of the technique for quality control is discussed.

B.J.

A82-11190 The contoured-oxide monolithic series-array solar battery. E M. Murray (Hewlett-Packard Laboratories, Palo Alto, CA) and R. M Warner, Jr. (Minnesota, University, Minneapolis, MN) Journal of Applied Physics, vol 52, Oct. 1981, p 6352-6356. 7 refs.

The paper presents the monolithic series-array solar battery, which combines integrated circuit and solar battery technology to trade current for voltage and increase the flexibility of the photovoltaic system design. The flexibility holds over a wide range of incident power densities, and the battery offers cost and reliability benefits. The feasibility of the contoured-oxide approach is demonstrated, and power conversion efficiencies of 7 5% are exhibited. The low value is attributed to high series resistance caused by a process omission. Shunting, which is attributable to poor device isolation, is discussed, and corrective modifications are suggested.

A82-11207 Simple tracking strategies for solar concentrations. A. W. G Cope and N Tully (Natal, University, Durban, Republic of South Africa) Solar Energy, vol 27, no. 5, 1981, p. 361-365. 6 refs.

Consideration is given to the validity of single axis tracking systems for solar concentrators of low to medium concentration ratios having moderate acceptance angles. If the misalignment between the sun and reflector normals is within the acceptance angle perfect tracking can be assumed. Rotation about a fixed polar axis gives a constant misalignment equal to the sun's declination angle on that day. Rotation about a declination axis gives perfect alignment at noon, but increasing misalignment towards each end of the day varying with the time from the equinoxes. Data is also given for monthly adjustment of the declination axis. All the results are independent of latitude.

(Author)

A82-11209 Design and testing of a uniformly illuminating nontracking concentrator. A. Gupta, S. Kumar, Mr. Murlidhar, and V. K. Tewary (Birla Institute of Technology and Science, Pilani, India). Solar Energy, vol. 27, no. 5, 1981, p. 387-391. Research supported by the Ministry of Industrial Development.

The transverse parabolic shape of the reflecting surface in the Winston nontracking solar concentrator has been modified so that the illumination at the receiver is exactly uniform for certain angles of incidence, and reasonably uniform for other angles. An exact mathematical expression has been derived for the transverse shape of the reflecting surface, which reduces to the Winston parabolic shape in the limit of extreme nonuniformity. The performance of the

proposed design has been analysed theoretically as well as tested experimentally. Experimental studies show that the illumination at the receiver remains uniform to within 10-12% with no lateral shadows throughout a typical solar day. The proposed design should therefore be quite suitable for photovoltaic applications.

A82-11210 Modeling and testing a salt gradient solar pond in northeast Ohio. S A. Shah, T. H Short, and R P Fynn (Ohio Agricultural Research and Development Center, Wooster, OH) Solar Energy, vol 27, no 5, 1981, p 393-401 21 refs

A82-11211 Focal plane flux distributions produced by solar concentrating reflectors. J. A Harris and W. S Duff (Colorado State University, Fort Collins, CO). Solar Energy, vol 27, no 5, 1981, p 403-411, 5 refs.

A new method is proposed for computing focal plane flux distributions from solar concentrators of parabolic trough, parabolic dish, linear Fresnel, and circular Fresnel geometries. The method is based on efficient numerical equations and allows for the reflecting surface quality and concentrator contour accuracy. Computer implementation of the proposed flux models makes it possible to use mathematical programming techniques that can search a large parameter space for optimum concentrator/absorber designs. V.L.

A82-11212 The effect of inclination on the heat loss from flat-plate solar collectors. P I. Cooper (Commonwealth Scientific and Industrial Research Organization, Div of Mechanical Engineering, Highett, Victoria, Australia) Solar Energy, vol. 27, no 5, 1981, p 413-420 9 refs

The top loss coefficient is calculated for single glazed flat-plate collectors as a function of plate temperature, wind speed, ambient temperature, and plate emittance for a typical spacing and an angle of inclination of 45 deg. The sky temperature is assumed to be 12 C below ambient temperature, and an effective sink temperature is defined for top losses from the collector. It is found that the value of the top loss coefficient is insensitive to the effective sink temperature and that the effective temperature is determined solely by the wind speed for a given collector inclination. It is also shown that there is a continual reduction in the top loss coefficient up to an inclination of 90 deg.

V.L.

A82-11213 Performance analysis of d.c.-motor-photovoltaic converter system. II - Series and shunt excited motors. J Appelbaum (Tel Aviv University, Tel Aviv, Israel) Solar Energy, vol 27, no 5, 1981, p 421-431

A82-11214 * An experimental study of \$03 dissociation as a mechanism for converting and transporting solar energy. J. H McCrary, G. E McCrary (New Mexico State University, Las Cruces, NM), T A. Chubb (U.S. Navy, Naval Research Laboratory, Washington, DC), and Y S Won (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). Solar Energy, vol 27, no. 5, 1981, p 433-440. 6 refs Research supported by the U.S. Department of Energy.

The high temperature catalytic dissocation of SO3 is an important chemical process being considered in the development and application of solar-thermal energy conversion, transport, and storage systems. A facility for evaluating chemical converter-heat exchangers at temperatures to 1000 C with high flow rates of gaseous SO3 feedstock has been assembled and operated on the NMSU campus. Several quartz and metal reactors containing different catalyst configurations have been tested. Descriptions of the test facility and of the reactors are given along with a presentation and discussion of experimental results.

A82-11215 Plutonium thermochemical solar cell. G L. Silver (Monsanto Research Corp., Mound Facility, Miamisburg, OH). Solar Energy, vol. 27, no. 5, 1981, p. 443, 444. 9 refs Contract No. DE-AC04-76DP-00053.

An electrical energy producing cycle is proposed which uses aqueous plutonium as its working fluid. The principle of the proposed cycle is that more work can be extracted from a process which reduces plutonium at constant acidity form N1 to N2 (N1 is greater than N2) than is required to reoxidize the plutonium from N2 to N1 at some lower value of the acidity. The operation of a cell

in which one half is a plutonium solution and the other half is a normal hydrogen electrode is described V L.

A82-11334 Investigations of the OCVD transients in solar cells. L. Castañer, E. Vilamajó, J. Llaberia, and J. Garrido (Barcelona, Universidad Politécnica, Barcelona, Spain). *Journal of Physics D - Applied Physics*, vol. 14, Oct. 14, 1981, p. 1867-1876. 12 refs.

A theoretical analysis of the OCVD transients in solar cells has been done taking into account capacitive effects affecting the decay. An experimental method is described which improves the accuracy of measurements. Numerical and experimental verification of the predicted results is also described. (Author)

A82-11343 Stability of n-i-p amorphous silicon solar cells. D. L. Staebler, R. S. Crandall, and R. Williams (RCA Laboratories, Princeton, NJ). Applied Physics Letters, vol. 39, Nov. 1, 1981, p. 733-735, 12 refs. Contract No. ET-78-C-03-2219

Unencapsulated, amorphous silicon indium tin oxide/n-i-p/stainless-steel solar cells were tested for stability. All cells have excellent shelf life. Changes occur during exposure to light, but can be controlled by the deposition conditions of the amorphous silicon. The changes are due to trapping and recombination of optically generated carriers in the i layer, and are reversibly annealed out above 175 C. Preliminary life tests on two relatively stable cells showed a small initial drop to 5%, followed by a weak logarithmic decay that predicts only about 20% further decrease in efficiency after 20 years in sunlight. Work is continuing on improving the efficiency and stability of these cells. (Author)

A82-11344 Efficient Si solar cells by low-temperature solid-phase epitaxy. B -Y Tsaur, G. W. Turner, and J. C. C. Fan (MIT, Lexington, MA). Applied Physics Letters, vol 39, Nov. 1, 1981, p. 749-751. USAF-supported research.

Solid-phase epitaxial Si layers of uniform thickness have been grown at 400-500 C by transport of Si atoms from an amorphous Si film through an Al film deposited on 100 line-type single crystal or polycrystalline n-type Si substrates. The epitaxial Si layers are strongly p type due to Al doping, and good rectifying junctions are formed between these layers and substrates. Solar cells with conversion efficiences at AM1 of 10.4 and 8.5% have been fabricated on 100 line-type Si and polycrystalline Si substrates, respectively, without the use of an antireflection coating or back-surface field structure. (Author)

A82-11386 A novel latent heat storage for solar space heating systems - Refrigerant storage. N R Sheridan (Queensland, University, Brisbane, Australia) and S C. Kaushik Applied Energy, vol 9, Nov. 1981, p 165-172. 7 refs Research supported by the Australian Research Grants Committee and University of Queensland.

This paper proposes a novel latent heat storage which is applicable to solar space heating systems. The device is similar to an absorption refrigerator and stores liquid refrigerant which is subsequently evaporated to release the latent heat it will recover the energy in a heat pump mode for application to solar space heating systems which are seen to be more cost effective - and hence to have a better market potential - than space cooling systems. (Author)

A82-11387 Efficiency of Fresnel lenses. P. Kumar Gupta (Indian Institute of Technology, New Delhi, India) Applied Energy, vol 9, Nov 1981, p 173-183 5 refs.

The efficiency of Fresnel lenses is discussed with respect to optical (reflection and transmission) losses. The efficiencies of lenses of different step widths, i.e., 2, 3, 4 and 5 mm, are the same (91.9%) in the case of reflection losses, and the maximum efficiency of a lens of 5 mm step width is 95.8% with respect to transmission losses. K.S.

A82-11390 Geometrical optical performance studies of a composite parabolic trough with a fin receiver. S S Mathur, T. C Kandpal, R N Singh, and A. K. Singhal (Indian Institute of Technology, New Delhi, India). Applied Energy, vol 9, Nov 1981, p 223-229

The geometrical optical performance characteristics of a composite parabolic trough (CPT) with a fin receiver have been studied. The variation of geometrical concentration ratio with mirror element

size and the rim angle of the parent parabola has been studied and the results are presented graphically. The distribution of local concentration ratio over the receiver plane has also been determined for some typical concentrator designs. (Author)

A82-11421 Analysis of power, mass, and size parameters of solar vapor-turbine two-circuit systems with organic working bodies. V. A. Grilikhes, M. M. Grishutin, and V. S. Evseev. (Geliotekhnika, no. 1, 1981, p. 5-14.) Applied Solar Energy, vol. 17, no. 1, 1981, p. 3-11. 11 refs. Translation.

The power efficiency, mass and sizing parameters of two-circuit solar vapor-turbine systems based on an organic working fluid are analyzed Calculations are performed for systems using a diphenyl mixture as the working fluid and incorporating a jet condenser which condenses the flowing vapor and acts as a heat pump with two-stage refrigeration and heat removal by radiation. Expressions for the power efficiency and the specific radiator area (with respect to useful electric power delivered) are derived in terms of radiator emittance and efficiency, mechanical pump power required, pump efficiency, adiabatic temperature drop and the thermal balance equation, and it is shown that these parameters depend on the jet condenser parameters. Estimates of the effects of vapor flow pressure and the temperature of the liquid upon entry to the jet condenser on system efficiency and specific area are then presented, and an alternative to the device considered which overcomes its limitations of high specific radiator area by the division of vapor flow into two parts following first-stage regeneration is presented. Calculations show that the let condenser is capable of providing the required circulation in both systems.

A82-11422 Cascade photogenerators based on silicon and germanium matrix photoconverters. D. S. Strebkov, V. A. Tikhomirova, and G. B. Fedosova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR) (Geliotekhnika, no. 1, 1981, p. 21-23) Applied Solar Energy, vol. 17, no. 1, 1981, p. 18-20 Translation

The construction of a cascade solar array based on silicon and germanium matrix-type solar cells is reported. Arrays were connected in parallel according to the criterion of equal operating voltages under optimal loads in each stage, and in series according to the criterion of the equality of operating currents, based on measurements of the volt-ampere characteristics of the devices. Measured photocurrents produced under illumination by a tungsten lamp at an irradiance of 0.1 W/sq cm indicate improvements in efficiency relative to the most efficient single material (silicon) amounting to 2% for the germanium irradiated through silicon, and 35-40% for germanium irradiated directly. It is pointed out that the present devices may be useful as photocells with a wide band of spectral sensitivity.

A.L.W.

A82-11423 Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors. S I Smirnov, lu A Konstantinovskii, and A S Torshin (Gosudarstvennyi Nauchnolssledovatel'skii Energeticheskii Institut, Moscow, USSR) (Geliotekhnika, no 1, 1981, p 24-28) Applied Solar Energy, vol 17, no 1, 1981, p 21-24 Translation

Consideration is given to the effects of a nonuniform distribution of the heat-carrying fluid flow rates in an array of identical solar collectors connected in parallel on the heat output of the array. An expression is derived for the factor by which total heat output in uniform flow differs from that in nonuniform conditions in terms of water inflow and outflow rates from the separate collectors. Calculations show that for a given flow rate through the array, heat output decreases with increasing flow nonuniformity, however significant decreases in output are only produced at very large flow nonuniformities. Results are presented of experimental measurements of heat output from an array of ten parallel branches containing four collectors each and operating at different flow rates which confirm the theoretical results.

A.L.W.

A82-11424 Combined solar-energy converters with selective coatings. M. M. Koltun (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). (Geliotekhnika, no. 1, 1981, p. 54-60) Applied Solar Energy, vol. 17, no. 1, 1981, p. 48-54. 25 refs Translation.

The role of selective optical coatings in increasing the efficiency of combined solar energy converters, which may consist of two or more devices operating on the same physical principle in different spectral regions, or two energy conversion devices based on different principles, is discussed. Consideration is given to uses of specially designed selective coatings to improve the efficiencies of cascade solar cells, photovoltaic/thermal solar energy converters, which produce both heat and electricity simultaneously, and thermophotoelectric converters, which transform thermal radiation into electrical energy using narrowband semiconductors. It is concluded that, partly due to the use of selective coatings, combined solar energy converters appear to be the most suitable for future solar energy research.

A.L.W.

A82-11425 Efficiency of selective surfaces for solar thermal collectors. R A. Zakhidov, A. Abdurakhmanov, and Sh. I. Klychev (Akademiia Nauk Uzbekskoi SSR, Spetsial'noe Proektno-Konstruktorskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR). (Geliotekhnika, no. 1, 1981, p. 61-66.) Applied Solar Energy, vol. 17, no. 1, 1981, p. 55-60 Translation

A82-11541 Solar energy technology - A five-year update.

M. K. Simmons (General Electric Co., Schenectady, NY) In. Annual review of energy. Volume 6 Palo Alto, CA, Annual Reviews, Inc., 1981, p. 1-42 143 refs.

Major developments and trends in the field of solar energy in the past five years are reviewed. The tremendous growth in both the intensity and diversity of solar energy research and development projects is illustrated by the growth of government funding in the past decade. Attention is then given to the major directions and objectives of technology advances in the areas of solar and wind resource assessment, low temperature systems including the flat-plate solar collector and storage technology, medium-temperature systems with sunlight concentration for industrial applications, thermal electric and high-temperature systems including the 10 MW(e) pilot plant under construction in Barstow, California, wind energy, biomass production and conversion, photochemical and photovoltaic conversion, ocean thermal energy conversion, and satellite power systems. The rapid, however uneven, growth in the application of solar technology to water and space heating, utilization, and wind and photovoltaics in electricity generation is considered, and future prospects for solar technologies in light of commercial, political, social, and environmental concerns are discussed. A L.W.

A82-11710 * # A solar simulator-pumped gas laser for the direct conversion of solar energy. W R Weaver (NASA, Langley Research Center, Hampton, VA) and J. H Lee (Vanderbilt University, Nashville, TN). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 84-88. 12 refs. Grant No. NCC1-8

Most proposed space power systems are comprised of three general stages, including the collection of the solar radiation, the conversion to a useful form, and the transmission to a receiver. The solar-pumped laser, however, effectively eliminates the middle stage and offers direct photon-to-photon conversion. The laser is especially suited for space-to-space power transmission and communication because of minimal beam spread, low power loss over large distances, and extreme energy densities. A description is presented of the first gas laser pumped by a solar simulator that is scalable to high power levels. The lasant is an iodide C3F7I that as a laser-fusion driver has produced terawatt peak power levels.

A82-11711 # A spacecraft thermophotovoltaic power source with thermal storage. J G Severns and M H Cobble. In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p. 89-94 18 refs

A solar fired thermophotovoltaic space power supply with thermal storage is proposed. A method is described for estimating component sizes for a given orbit and required load. The well known efficiency enhancement obtainable from a selective radiator is utilized with an Er2O3 radiator used with a germanium photovoltaic.

The possibility of using Yb2O3 with a silicon cell is pointed out, but the high radiator temperatures required make its compatibility with thermal storage doubtful. Temperature difference required to conduct the necessary thermal loads into and through the thermal storage vessel are approximated for two different examples an oxide eutectic, Al2O3-BeO, melting at 2108 K and silicon melting at 1685 K. The highest delta T values needed for a 1 kW rated supply is 166 K. A cassagrain/solar concentrator is described for this application, the major causes of spread of the solar image at the absorbing aperture are discussed and their importance ranked. (Author)

A82-11712 * # Direct conversion of light to radio frequency energy. J. W. Freeman and S. Simons (Rice University, Houston, TX). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 95, 96. Research supported by the Brown Foundation of Houston, Grant No NAG3-29.

A description is presented of the test results obtained with the latest models of the phototron. The phototron was conceived as a replacement for the high voltage solar cell-high power klystron combination for the solar power satellite-concept. Physically, the phototron is a cylindrical evacuated glass tube with a photocathode, two grids, and a reflector electrode in a planar configuration. The phototron can be operated either in a biased mode where a low voltage is used to accelerate the electron beam produced by the photocathode or in an unbiased mode referred to as self-oscillation. The device is easily modulated by light input or voltage to broadcast in AM or FM. The range of operation of the present test model phototrons is from 2 to 200 MHz.

G R.

A82-11736 * # High power solar array switching regulation.

D. K. Decker, J Cassinelli (TRW Defense and Space Systems Group, Redondo Beach, CA), and M. Valgora (NASA, Lewis Research Center, Cleveland, OH) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p. 224-231

It is pointed out that spacecraft utilization projections for the 1980s and beyond show a trend toward extended lifetimes and larger electric power systems. The need for improved power management and energy transfer arising in connection with this trend has resulted in the conduction of a Solar Array Switching Power Management study. A description is presented of initial development work performed in the study, taking into account the characteristics for three mission classes. Attention is given to the manned LEO platform (50-kW average load), the unmanned GEO platform (50-kW average load), and an ion propulsion orbit transfer vehicle (50- to 250 kW load).

A82-11738 # Series vs. shunt regulators for power control in satellite power systems. J. R. Sheie, R. E. Corbett, and M. C. Glass (Lockheed Missiles and Space Co., Inc., Sunnyvale, CA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p. 235-240

The relative advantages and disadvantages of the series and shunt power-control approaches for various applications are examined, including high and low power and high and low earth orbit. A comparative study of the series and shunt power-control techniques is carried out, with consideration given to solar array sizing, power-control weight, equipment heat dissipation, power availability, and electromagnetic interference characteristics. A trade study example is given for specific applications where cost is the evaluation criterion.

A82-11741 * # Cost and performance projections for SPS photovoltaic blankets. J. A. Scott-Monck (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p. 255-260 12 refs.

An estimate, based on optimistic projections of current technology, is given for the specific power of photovoltaic blankets which might be achieved if the SPS concept was to be implemented. A simultaneous consideration of cost and technical requirements is used to identify key blanket technologies which must be developed for this reference system. The terrestrial photovoltaic experience coupled with new technology is used to develop cost estimates for the blanket, assuming an annual demand of 5 GW and a manufacturing industry dedicated to blanket production. The results indicate that blanket specific power goals may be exceeded, but there is little prospect that the cost goals can be met. This argues for a reconsideration of the photovoltaic option based on more expensive but higher performance blankets.

(Author)

A82-11742 # Satellite power systems /SPS/ energy conversion and power management. A. A Nussberger (Rockwell International Corp., Space Operations and Satellite Systems Div., Seal Beach, CA) In. Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 1

New York, American Society of Mechanical Engineers, 1981, p. 261-265.

Impacts on the reference concept resulting from alternatives to microwave conversion, photovoltaic techniques, solar concentration ratio and power distribution voltage are discussed. Alternatives include solid state RF conversion such as sandwich configurations and end-mounted antenna configurations, and magnetron RF conversion including advanced pivoting panel configurations. Mass estimates are compared to a normalized point (2.3 kg/kw), and it is found that the estimates have grown over the past six years by a factor of 2.3 for the reference GaAs concept and 3.5 for the reference silicon concept. Mass savings from the use of multi-bandgap solar cells is shown at an efficiency of 30%, and it is concluded that the advance magnetron concept incorporating improvements from evolving technology developments can provide a very competitive program.

D L.G

A82-11758 * # High performance silicon solar arrays employing advanced structures. D E. Rockey (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA), J M. Hedgepeth, and L. Adams (Astro Research Corp., Carpinteria, CA). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 1

New York, American Society of Mechanical Engineers, 1981, p. 374-379, 7 refs. Contract No NAS7-100

Specific design features to reduce cell mass, lower panel operating temperatures, and improve power to mass ratios for silicon solar cell arrays in space applications are presented. Because mass constraints limit payload capacity for launch into GEO, graphite/ epoxy structures combined with high performance Si cells are needed to deliver a power/mass ratio of 265 W/kg, notably for Solar Electric Propulsion systems, compared with existing level of 65 W/kg. Shallow diffusion and back surface field cell technology have raised cell efficiencies to 15%, with a back emissivity of 1.64. Structural design requirements comprise Shuttle interface compatibility, full ground test capability, low mass, and high stiffness. Three array alternatives are discussed, and the STACBEAM configuration, which consists of a triangular truss and a piston deployer with folding accomplished on simple hinges, provides 0.2 Hz stiffness and achieves the design power/mass goals. DH.K.

A82-11759 # Solar panel current degradation factors. M T Gates (Hughes Aircraft Co., Culver City, CA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings, Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 380-382.

Degradation factors that cause current losses distributed unequally over a string of solar cells in series are discussed. A high efficiency solar cell type is used for the investigation with computer simulations to calculate the expected current losses incurred. The study includes analyses of flat panel loss, short circuit current loss in folded cell strings, and folding loss in strings at various operating voltages. Results show that the actual current loss for many conditions is nearly linear with respect to the percent of the string covered, and for voltages at or near the maximum power voltages, and losses are linear even at 5% darkening.

D.L.G.

A82-11761 * # Nonimaging concentrators for photovoltaic arrays in space. R. Winston, P. Greenman (Chicago, University, Chicago, IL), and D. Rockey (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p 390-392. 8 refs. Research supported by the California Institute of Technology.

Two stage concentrators are studied in order to design an optimum concentrator for photovoltaic arrays in space. The study is directed at designs with two-dimensional geometries because they are better suited to moderate concentrations of about 10 X to 50 X, and because the instantaneous flux distribution is more uniform. It is found that with an f/0.5 primary, where f is the focal length of the primary, the flux distribution is very smooth regardless of the angle of incidence of the radiation. As the focal ratio is increased, peaks in the distribution begin to appear. The nonuniformities can be reduced by introducing small, closely spaced distortions into the reflecting surfaces, and practical arrays can achieve a concentration of 10 when the acceptance half angle is 4.25 deg or 50 when the acceptance half angle is + or - 1 deg.

D.L.G.

A82-11762 * # High- and low-resistivity silicon solar cells. A. Meulenberg, Jr. and R A Arndt (COMSAT Laboratories, Clarksburg, MD). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p. 397-399 13 refs, Research sponsored by the Communications Satellite Corp., Contracts No. NAS3-21280, No. NAS3-22217

Attention is given to recent work at COMSAT Laboratories on improving silicon solar cell efficiencies and open-circuit voltages for both high (more than 1000 ohm-cm) and low (less than 1 ohm-cm) resistivities. It is noted that open-circuit voltages above 650 mV have been obtained for 0.1 ohm-cm cells and that air mass zero efficiencies of 12.5% have been measured from 4-mil 1,250 ohm-cm.

A82-11763 * # Solar cell development for the Power Extension Package. C R Baraona (NASA, Lewis Research Center, Cleveland, OH) and J. L Cioni (NASA, Johnson Space Center, Houston, TX). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 400-403. 6 refs

The Power Extension Package (PEP), a 32-kilowatt, flexible-substrate, retrievable solar array system for use on the Space Shuttle, is described. It is noted that solar cell costs will be reduced by increasing cell area and simplifying cell and coverglass fabrication processes and specifications. The tests that have been carried out on the cells are described, among them a unique radiation damage test and a side-by-side comparison of candidate cell types with pre- and post-irradiation airplane calibration of outer space short-circuit current.

A82-11764 # Thin cells - Their present status and future areas of development. J. H. Wohlgemuth (Solarex Corp., Rockville, MD). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 404-408. 10 refs.

Silicon solar cells as thin as 50 microns are fabricated with AMO efficiencies greater than 15%. A chemical etching method is used on thin regular silicon wafers to reduce them to the required thicknesses. The production of textured thin cells, gridded back contact thin cells, and vertical junction thin cells is reviewed, and future possibilities of enhancing cell performance are discussed.

D.L.G.

A82-11765 * / Gallium arsenide solar cells-status and prospects for use in space. H. W. Brandhorst, D. Flood, and I. Weinberg (NASA, Lewis Research Center, Cleveland, OH). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1 New York, American Society of Mechanical Engineers, 1981, p. 409-415 27 refs

Gallium Arsenide solar cells now equal or surpass the ubiquitous

silicon solar cells in efficiency, radiation resistance, annealability, and in the capability for producing usable power output at elevated temperatures. NASA has developed a long-range research and development program to capitalize on these manifold advantages. In this paper we review the current state and future prospects for R&D in this promising solar cell material, and indicate the progress being made toward development of GaAs cells suitable for a variety of space missions. Results are presented from studies which demonstrate conclusively that GaAs cells can provide a net mission cost and weight savings for certain important mission classes. (Author)

A82-11766 # GaAs solar cells for space application. G. S. Kamath (Hughes Research Laboratories, Malibu, CA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1
New York, American Society of Mechanical Engineers, 1981, p. 416-421

It is noted that the status of GaAs solar cells for space power applications has been greatly enhanced by recent developments. Techniques for the large-scale development of space-qualified cells have been perfected at Hughes Research Laboratories using liquid phase epitaxial methods. GaAs cells have been produced with large areas (2 x 4 sq cm) and with reduced thickness (less than 2 mils), the power capacity of these cells is fully equal to the conventional 2 cm x 2 cm cell previously produced. It is noted that in addition to the higher efficiency of the GaAs cells in comparison with silicon, they also have increased radiation hardness to most radiation. It is pointed out that the cost of Ga has come down from \$3/g in 1960 to \$0.50 in 1980. It is concluded that GaAs is a viable candidate for solar cell application in space power systems and that the advances to date justify their use for specific missions, even at today's cost.

A82-11767 * # High efficiency thin-film GaAs solar cells. S. Zwerdling, K. L. Wang, and Y C M. Yeh (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p.

New York, American Society of Mechanical Engineers, 1981, p. 422-427. Research sponsored by the U.S. Department of Energy, U.S. Air Force, and NASA.

The paper demonstrates the feasibility of producing high-efficiency GaAs solar cells with high power-to-weight ratios by organic metallic chemical vapor deposition (OM-CVD) growth of thin epi-layers on suitable substrates. An AM1 conversion efficiency of 18% (14% AM0), or 17% (13% AM0) with a 5% grid coverage is achieved for a single-crystal GaAs n(+)/p cell grown by OM-CVD on a Ge wafer. Thin GaAs epi-layers OM-CVD grown can be fabricated with good crystallographic quality using a Si-substrate on which a thin Ge epi-interlayer is first deposited by CVD from GeH4 and processed for improved surface morphology.

D.L.G.

A82-11769 * # Power management of multi-hundred kilowatt spacecraft power systems. D. K. Decker, G. W. Fleck (TRW Defense and Space Systems Group, Redondo Beach, CA), and J. Graves (NASA, Marshall Space Flight Center, Huntsville, AL). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p. 434-439

A NASA-sponsored study of space power distribution system technology is in progress to develop an Autonomously Managed Power System (AMPS) for large space power platforms. The conceptual design of a 250 kW photovoltaic power system, including the power management subsystem (PMS), is presented. A PMS concept is derived based on the need to accommodate the increased complexity of a utility-type power system, and to minimize Shuttle resupply and ground station operational costs. The main PMS functions are discussed along with the control strategies of the autonomously managed power system.

A82-11772 # The evaluation of four solar-array-powered multi-kW power conditioners for Space Shuttle Orbiter application.

M. C. Wright (Lockheed Engineering and Management Services Co., Houston, TX). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings.

Volume 1. New York, American Society of Mechanical Engineers, 1981, p 451-456. 6 refs.

The performance of solar-array-powered multikilowatt power conditioners for application on the Space Shuttle Orbiter Power Extension Package (PEP) is evaluated. The application, application requirements, and performance test results are discussed. The PEP goals and requirements are thought to be attainable by utilizing existing power conditioning technology.

C.R.

A82-11773 # . The Texas Instruments Solar Energy System development, E. L. Johnson (Texas Instruments, Inc., Dallas, TX). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1

New York, American Society of Mechanical Engineers, 1981, p. 798-804. Contract No. DE-AC01-79ER-10000

The system is described, showing that energy conversion and storage functions are combined in a novel way. Here, small silicon solar cells are immersed in an electrolyte and the current generated by the cells is used directly to electrolyze a halogen acid, for example, HBr. The hydrogen and bromine produced can be stored separately until needed and then recombined in a fuel cell to give electrical energy on demand. The fuel cell HBr product is returned to the solar chemical convertor, thus completing the closed loop energy-cycle in summarizing the achievements to date, it is noted that feasibility demonstration of a 13% array electrical efficiency prepared by a laboratory process and 10% array efficiencies have been obtained from potentially scalable solar cell and array processes

C.R

A82-11778 # Small sodium sulfur battery for solar and wind energy systems. H. J. Haskins and A. G. Domaszewicz (Ford Aerospace and Communications Corp., Aeronutronic Div., Newport Beach, CA). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical

Engineers, 1981, p. 836-840. Contract No DE-AM02-79CH-10012.

A conceptual design of a 1 MWh sodium-sulfur storage battery is given. The battery is to be used in small (15 kW), stand-alone solar or wind electrical power systems. The design uses approximately 1,400 sodium-sulfur cells of a new, high energy capacity configuration. The cells are connected in a parallel/series network to give a discharge voltage of 120 VDC minimum, and with sufficient cell redundancy for a 10 year battery life. A description is given of the battery structure, thermal enclosure, and controls. Battery performance estimates are given, including the effect of thermal losses. It is concluded that sodium-sulfur batteries hold promise for good performance and reliability in small, stand-alone power systems. C.R.

A82-11780 # Molten salt thermal energy storage subsystem for Solar Thermal Central Receiver plants. P. B. Wells (Martin Marietta Aerospace, Denver, CO) and G. P. Nassopoulos (American Technigaz, Inc., Hingham, MA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 925-930. Research supported by the U.S. Department of Energy.

The development of a low-cost thermal energy storage subsystem for large solar plants is analyzed. Molten nitrate salt is used as both the plant's working fluid and as the storage medium. The storage system comprises a specially designed hot tank to hold salt at a storage temperature of 839 K (1050 F) and a separate carbon steel cold tank to hold the salt after its thermal energy has been extracted to generate steam. The hot tank is lined with insulating firebrick to lower the shell temperature to 561 K (550 F) so that a low-cost carbon steel shell can be used. A preliminary design is described for a large commercial-size plant (1200 MWht). Also described are a laboratory test program for the critical components and the design, construction, and test of a small-scale research experiment at the Central Receiver Test Facility in Albuquerque, New Mexico. C.R.

A82-11781 # Ground-mounted thermal storage for the parabolic dish solar collector/Stirling engine system. R. J. Copeland, J. Ullman (Solar Energy Research Institute, Golden, CO), and J. W. Leach (North Carolina State University, Raleigh, NC) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta,

GA, August 9-14, 1981, Proceedings. Volume 1 New York, American Society of Mechanical Engineers, 1981, p. 935-940 5 refs

Several types of pumped-fluid thermal energy transport and phase-change thermal storage systems are examined. The pumped fluid circulates through a symmetrically arranged group of collectors within a large collector field and transports thermal energy to the engine/thermal storage subsystem near the center of the connected cluster. Cost analyses are made on the basis of variations in the designs of the major components. Pressurized liquid transport fluids and saturated liquids that boil in the solar receiver to return as vapors are investigated. A number of liquid metals are considered for each type of thermal energy transport. Conventional insulation and vacuum-jacketed multilayer foil type insulation designs are assessed. Also investigated are tube-intensive and direct-contact type heat exchangers.

C.R.

A82-11793 # Advances in photovoltaics R&D - An overview.
L. L. Kazmerski (Solar Energy Research Institute, Golden, CO). In:
Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2.

New York, American Society of Mechanical Engineers, 1981, p. 1637-1641, 35 refs.

Solar cells based upon polycrystalline and amorphous Si, CdS, GaAs, and emerging materials are covered for thin film applications. In the context of the discussion, a thin-film solar cell is one whose active layer is near the minimum required for adequate current collection. Therefore, 50-100 micrometers of polycrystalline Si can be defined as thin film, in contrast to 1-10 micrometers of amorphous Si. A description is provided of highly efficient, nonconventional approaches to concentrator cell applications, taking into account developments in the cell fabrication and module demonstration areas.

G.R.

A82-11794 # The development of high efficiency cascade solar cells - An overview. M. L. Timmons, J. A. Hutchby, S. M. Bedair, and M. Simons (Research Triangle Institute, Research Triangle Park, NC). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1642-1644. 9 refs. Research supported by the Solar Energy Research Institute and U.S. Air Force.

Multiple junction solar cells offer potential efficiencies much higher than single junction cells. These high efficiencies are achieved by minimizing the heat losses. Two approaches of utilizing multiple junctions have been demonstrated experimentally. The two approaches are related to spectral splitting and the tandem cell concept. The limiting factor of spectrum splitting is the cost of the reflective filter. The tandem cell technology is new, and device areas are still quite small.

G.R.

A82-11795 # Research activities of solar cells in ROC. H. L. Hwang (National Tsinghua University, Hsinchu, Republic of China) and C. Y. Sun (Industrial Technology Research Institute, Hsinchu, Republic of China). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1645-1648. 24 refs.

Silicon solar cell research is considered, taking into account the preparation of a Schottky-barrier silicon solar cell with the aid of an electroless plating process, silicon epitaxial layers grown by chemical vapor deposition (CVD), and ion-implantation techniques employed to fabricate silicon grating-type solar cells. Research on alternative solar cells is also reported. Organometallic CVD has been used in the fabrication of a Cu25/CdS solar cell. Investigations regarding CuInS2 as a new photovoltaic material are discussed.

A82-11796 * # Multijunction high voltage concentrator solar cells. G. J. Valco, V. J. Kapoor (Case Western Reserve University, Cleveland, OH), J. C. Evans, and A.-T Chai (NASA, Lewis Research Center, Cleveland, OH). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1649-1653. NASA-supported research.

The standard integrated circuit technology has been developed to design and fabricate new innovative planar multi-junction solar cell chips for concentrated sunlight applications. This 1 cm x 1 cm cell consisted of several voltage generating regions called unit cells which were internally connected in series within a single chip resulting in high open circuit voltages. Typical open-circuit voltages of 3.6 V and short-circuit currents of 90 ma were obtained at 80 AM1 suns. A dramatic increase in both short circuit current and open circuit voltage with increased light levels was observed. (Author)

A82-11797 # A central tower solar test facility /RM/CTSTF/. S. Bevilacqua and R Gislon (Comitato Nazionale per l'Energia Nucleare, Rome, Italy). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1742-1745. 9 refs.

The considered facility is intended for the conduction of test work in connection with studies of receivers, thermodynamic cycles, heliostats, components, and subassemblies. Major components of the test facility include a mirror field with a reflecting surface of 800 sq m, a 40 m tower, an electronic control system, a data-acquisition system, and a meteorological station. A preliminary experimental program is discussed, taking into account investigations related to facility characterization, an evaluation of advanced low-cost heliostats, materials and components tests, high-concentration photovoltatic experiments, and a study of advanced solar thermal cycles. G.R.

A82-11798 * # Secondary concentrators for parabolic dish solar thermal power systems. L. D. Jaffe and P. T. Poon (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2.

New York, American Society of Mechanical Engineers, 1981, p. 1752-1758. 18 refs. Research sponsored by the U.S. Department of Energy and NASA.

A variety of different concepts are currently being studied with the objective to lower the cost of parabolic mirrors and to provide alternatives. One of the considered approaches involves the use of compound concentrators. A compound solar concentrator is a concentrator in which the sunlight is reflected or refracted more than once. It consists of a primary mirror or lens, whose aperture determines the amount of sunlight gathered, and a smaller secondary mirror or lens. Additional small optical elements may also be incorporated. The possibilities and problems regarding a use of compound concentrators in parabolic dish systems are discussed. Attention is given to concentrating secondary lenses, secondary imaging and concentrating mirrors, conical secondary mirrors, compound elliptic secondary concentrating mirrors, and hyperbolic trumpet secondary concentrating mirrors.

G.R.

A82-11799 * # The effect of concentrator field layout on the EE-1 small community solar power system. R. L. Pons and R. E. Irwin (Ford Aerospace and Communications Corp., Aeronutronic Div., Newport Beach, CA). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p 1759-1763. 6 refs. Contract No. JPL-955637

The point-focusing distributed receiver (PFDR) concept is employed by a number of solar thermal power systems currently under development. One type of PFDR system which shows particular promise incorporates distributed energy generation. According to this concept each parabolic dish collector is a self-contained power generation module, and a conventional electrical system is used to interconnect the modules. The concept is thus modular, and any number of power modules can be combined to achieve the required plant size. Given the benefits of mass production, it appears that this type of system can produce electricity at lower cost than is projected for conventional (fossil) power systems over the next decade. An employment of organic Rankine cycle heat engines is considered.

A82-11800 * # Development of a solar receiver for an organic Rankine cycle engine. H J. Haskins, R. M. Taylor, and D. B Osborn (Ford Aerospace and Communications Corp., Aeronutronic Div.,

Newport Beach, CA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1764-1769. Contract No. JPL-955637.

A prototype power conversion assembly (PCA) developed by an American aerospace company is considered. The PCA will be mounted at the focal point of a 12 meter parabolic dish and will produce approximately 20 kW of 3 kHz ac power to a ground-mounted rectifier. The PCA includes a cavity receiver coupled to an organic Rankine cycle engine. The engine working fluid is toluene. The performance goals of the receiver design are to maximize both the thermal efficiency and the heat capacity of the core. The latter goal is desired for stabilizing the PCA operation during intermittent cloud cover. The receiver design is based upon the utilization of a direct-heated copper shell. It was necessary to develop a feasible manufacturing process for assuring a good braze joint between the stainless steel, containing the toluene, and the copper shell.

A82-11801 * # Control system development for a 1 MW/e/solar thermal power plant. E. R. Daubert, F. M. Bergthold, Jr, and D. G Fulton (Ford Aerospace and Communications Corp., Aeronutronic Div., Newport Beach, CA). In. Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1770-1775. Contract No. JPL-955115.

The point-focusing distributed receiver power plant considered consists of a number of power modules delivering power to a central collection point. Each power module contains a parabolic dish concentrator with a closed-cycle receiver/turbine/alternator assembly. Currently, a single-module prototype plant is under construction. The major control system tasks required are related to concentrator pointing control, receiver temperature control, and turbine speed control. Attention is given to operational control details, control hardware and software, and aspects of CRT output display.

A82-11802 # Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1, D. A. Hofer and B. L. Pierce (Westinghouse Electric Corp., Advanced Energy Systems Div., Pittsburgh, PA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1776-1781. Contract No. DE-AC03-79SF-10740.

Newman Unit No. 1 has an 82 MWe tandem-compound, double-flow, reheat steam turbine. It was built in 1960 for baseload duty using natural gas as the primary fuel. The solar repowered configuration utilizes water/steam central receiver technology to provide main steam to the high pressure stage and reheat steam to the intermediate stage of the turbine-generator. Fossil energy is used to supplement solar generated steam for intermittent cloudy day operation and for economic dispatch when solar energy is not available. To aid in the feasibility study for the solar repowering of the unit, a digital simulation model was developed. The results obtained with the model indicate that the system is able to handle average velocity clouds with little degradation of the quality of electric power output. Approaches for improvements are also discussed.

A82-11803 # An evaluation of alternate system configurations for solar repowering electric power plants. L E. Van Bibber and W. G. Parker (Westinghouse Electric Corp., Advanced Energy Systems Div., Pittsburgh, PA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1782-1786. Contract No. DE-AC03-79SF-10740.

The results of studies to determine the feasibility of using a solar tower power plant to repower an existing oil and gas fired electricity plant in El Paso, TX are presented. The existence of 3,500 acres of open land on site, lack of major environmental or legal constraints, increasing costs of conventional fuels, and the remaining economic life of an 82 MWe reheat steam turbine for which a pilot study could

effectively be made encouraged the study. One basic configuration was chosen and four others rejected. Heliostats with 57 sq m surfaces and a recirculative concept receiver tower were selected as items which would be commercially available in the near term; additional design considerations were concerned with several solar thermal/fossil fuel steam generator systems interfaces. The fossil fuel reheat boilers were considered as back-up for cloudy days, as storage showed no economic advantage. Economic projections indicate that production of standardized units would make the solar system economically competitive.

M.S.K.

A82-11804 # Photovoltaic system studies and developments. D. G. Schueler (Sandia Laboratories, Albuquerque, NM). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p 1832-1834. 17 refs Research supported by the U.S Department of Energy.

Photovoltaic technology has the potential of reducing dependence on conventional energy sources, if the cost of photovoltaic systems can be brought down in the range of \$2 per peak Watt. The major potential applications for photovoltaic technology have been extensively analyzed with regard to their economics, market potential, and system performance requirements. These include residential, commercial and industrial, and utility central generation applications. This paper reviews the essential features of these various applications and outlines ongoing development activities. (Author)

A82-11830 # Utilization of wind/solar energy in generating electricity in Saudi Arabia. A. E. M Nasser (Rıyadh, University, Rıyadh, Saudi Arabia). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 2060-2063.

Solar and wind data averages gathered for five years and plans for a 1.2-1.4 kW solar wind energy plant at Riyadh, Saudi Arabia are presented. Wind speeds were gathered at 2 m height averaging 3.9 m/sec, and extrapolated to 22 m and 5.45 m/sec, average solar intensity was found to be 600 W/sq m between 6 a.m and 6 p m. The generator system comprises a 5.5 m diameter multiblade windpowered turbine on a 10 meter tower and photovoltaic modules generating 500 W The NACA 0018 blade tips will be enclosed within a conical duct, augmenting the wind velocity by an expected 10%. Lead-acid batteries will be used for storage, initial applications of the system are targeted for remote villages and military outposts. M.S K.

A82-11839 # Advanced Satellite Power System /SPS/ concept, W V McRae and G M. Hanley (Rockwell International Corp., Space Operations and Satellite Systems Div., Seal Beach, CA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 3

New York, American Society of Mechanical Engineers, 1981, p. 2115-2118

Evolution in design, improvements in economics, and reductions in material and space requirements for the Satellite Power System (SPS) are reviewed. Selection of GaAs solar cells over silicon wafers has been made for reasons of self-annealing and better performance at higher temperatures, in addition to the fact that GaAs cells are the base configuration for multibandgap cells. These cells, when used with 6 1 reflectors, reduce satellite mass by 18%, with a corresponding reduction in satellite area of 75%. The SPS can then be sun-oriented, eliminating tilt control, employment of magnetrons instead of less efficient klystrons eliminates 15% of transmitter weight New evidence for ionospheric power density tolerance indicates higher permissible power levels, thus allowing larger and fewer (20 instead of 60) satellites delivering 7 57 GW per rectenna site, and capital costs are reduced 40%. Finally, open wire, parabolic rectennas will require 50% less in capital construction costs than former flat designs. The timetable for operational capability is now targeted for the year 2000

A82-11842 # 'Thin foil cells - A challenge for space array designers'. P A. Iles and F. Ho (Applied Solar Energy Corp., City of Industry, CA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings

Volume 3 New York, American Society of Mechanical Engineers, 1981, p. 2126-2128, 10 refs

The present status of manufacturing, power output, and life expectancy of thin foil silicon cells (less than 50 micron thickness) is reviewed Properties such as 14-15% efficiency, flexibility, light weight, radiation resistance, controllable absorptance, and area ranging from 4-25 sq cm are noted as favorable features, while the need for extra care in preparation, easy loss of a greater number of cells due to random cracking, and additional fabrication steps all add to costs. Lighter weight is a significant advantage in considerations for higher orbital placement, with present blanket thin cell packaging yielding from 50-330 W/lb Further testing is necessary to show operational durability in thermal cycling and LEO radiation, and for radiation hardness against diffusion length degradation or resistivity changes in the semiconductor. Additional testing is also needed to verify successful deployment of the blanket arrays. Progress toward thinner cells (25 micron) with slightly less efficiency and toward dendritic web production are mentioned as showing promise for further cost reductions

A82-11855 # Progress in large area photovoltaic devices based on amorphous silicon alloys. J. P. deNeufville, M. Izu, and S. R. Ovshinsky (Energy Conversion Devices, Inc., Troy, MI). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3.

New York, American Society of Mechanical Engineers, 1981, p. 2217-2220. 17 refs.

Photovoltaic cells using light absorbing thin amorphous films based on silicon appear to have properties suitable for the conversion of sunlight into electricity with a near-term efficiency in the range of 7-10% and at a cost in the range of 35-50 cents per peak watt. To meet these objectives, prototype 1-sq ft cells have been constructed and tested. The excellent yields obtained for such cells permitted the construction of a 24-sq ft array which produces useful power under exposure to both direct and diffuse natural illumination. Cost analyses and preliminary tests indicate that the deposition of electrodes and absorber in a continuous automated method of manufacturing will provide sufficient production throughput and device performance to meet the cost goals required for heat-to-head competition between a-Si alloy photovoltaics and conventional sources of electrical power in the U.S. (Author)

A82-11858 # A thermoelectric refrigerator powered by photovoltaic solar collectors. H. Sofrata. In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2239-2242, 5 refs

A82-12269 # The effect of variable fluid properties on scale modeling. J. S. Kraabel (Sandia Laboratories, Livermore, CA) In Momentum and heat transfer processes in recirculating flows, Proceedings of the Winter Annual Meeting, Chicago, IL, November 16-21, 1980. New York, American Society of Mechanical Engineers, 1980, p.103-110 5 refs Research supported by the U S Department of Energy

The heat transfer to the air about a solar central receiver may be described as high Reynolds number (about 10,000,000), high Grashof number (about 10 to the 13th) mixed orthogonal convection. Although it is a low Mach number flow, it is highly compressible because of the large surface to free-stream temperature differences (500 to 1000 C). One approach to scale model testing that simultaneously achieves large values of Re and Gr in a mixed convection regime uses low temperature (80K) nitrogen. The present study examines the effects of temperature dependent variable fluid properties on stagnation line heat transfer. Although applicable only in the region of the stagnation line, and only for forced convection, the solution is suitable for this initial investigation because it is relatively easy to determine and because it may be used as the initial condition for the remainder of the flow A comparison is made between solutions simulating scale model testing in low temperature nitrogen and solutions for ambient temperature air with wall temperatures equal to those of central receivers. The heat transfer coefficient described by Nu/square root of Re is found to be nearly constant for all circumstances studied. (Author)

A82-12501 International Scientific Conference on Space, 21st, Rome, Italy, March 25, 26, 1981, Proceedings (Convegno Internazionale Scientifico sullo Spazio, 21st, Rome, Italy, March 25, 26, 1981, Atti). Conference sponsored by the Ministero degli Affari Esteri, Ministero della Difesa, CNR, et al. Rome, Rassegna Intérnazionale Elettronica Nucleare ed Aerospaziale, 1981. 200 p. In Italian and English.

Papers are presented on solar power satellites and Spacelab technology. Topics covered include conversion and transmission techniques, safety problems, and structures and positioning in orbit. Attention is also given to cost considerations and energy balances for the SPS. Aspects of the first flight of Spacelab which were considered comprised scientific and technological experiments, material and life sciences, astronomy, plasma physics, and earth observations, experiment operation, and payload specialist training.

A82-12502 # Market potential and problems for SSPS. M. J. Claverie and A. P. Dupas (CNRS, Paris, France). In: International Scientific Conference on Space, 21st, Rome, Italy, March 25, 26, 1981, Proceedings. Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1981, p. 17-25.

The paper examines the SSPS (satellite solar power station) as an energy system on a worldwide basis and assesses the possible limitations of the worldwide use of the SSPS. It is suggested that the SSPS is a very promising concept for the United States, but its use in many parts of the world may be severely hampered by its large power output and its large land requirements. Such a situation may jeopardize the international acceptance of the project. Thus, the study of alternative concepts allowing smaller receivers on the ground and smaller minimum power of the receivers seems advisable in order to reach an acceptable concept of a worldwide SSPS system.

A82-12506 # Methods and problems of industrial-scale electric power generation from solar energy (Metodi e problemi per ricavare energia elettrica su scala industriale dalla solare). P. L. Finocchi (Consorzio per Sistemi di Telecomunicazioni via Satelliti S.p.A., Milan, Italy). In: International Scientific Conference on Space, 21st, Rome, Italy, March 25, 26, 1981, Proceedings Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1981, p. 53-67. 10 refs. In Italian.

Ground-based and space-based methods of electric power generation from solar energy are considered, with attention given to both technical and economic factors. Two systems are discussed in particular solar cells and thermoelectric generators, and attention is given to the technical and economic aspects of the construction and operation of satellite solar power stations.

B.J.

A82-12507 # Transportation systems and cost comparison for launching an SPS into geosynch. orbit. D. E. Koelle (Messerschmitt-Bolkow-Blohm GmbH, Ottobrunn, West Germany). In International Scientific Conference on Space, 21st, Rome, Italy, March 25, 26, 1981, Proceedings. Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1981, p. 81-89. 6 refs.

Total mass requirements and costs are compared for Shuttle and orbital transfer as opposed to single vehicle to GEO and ballistic missiles plus orbital transfer to GEO for launch of an SPS. Noting that Shuttle delivery for one SPS would cost 5 billion dollars and require over 200 flights, three different ballistic missile delivery systems are analyzed. Use of a 500 megagram vehicle to LEO followed by orbital transfer to GEO is projected to be 3.6-4.8 billion dollars per SPS. A flyback capability is observed to be the most preferable solution, and calculations show that an equatorial launch can save 500-800 million dollars per SPS. Criteria for minimum costs are given as fully reusable system, unmanned vehicle, minimum stages, technical simplicity, operational simplicity, large size, minimal ground and orbital operations, and the equatorial launch site. M.S.K.

A82-12509 # Solar power satellite system energy balance. A. Buratti (Compagnia Nazionale Satelliti per Telecomunicazione S.p.A., Rome, Italy). In International Scientific Conference on Space, 21st, Rome, Italy, March 25, 26, 1981, Proceedings.

Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1981, p. 99-103. 22 refs.

A literature review which concludes that the Shuttle is the basic launch system to LEO, in addition to an IUS, until the year 2000 is presented. Propellant to payload mass ratios are analyzed briefly to show that Shuttle launch can deliver only four tons to GEO, the prime site for the SPS. The energy requirements for propellant and solar array manufacture, and energy consumed in placing an SPS in GEO are calculated to be 5000 kWh/kg, while power delivered by an SPS is given as 700 kWh/kg. The results indicate that an improvement of one to two orders of magnitude is necessary for the SPS to satisfy the requirement that the energy it produces exceeds the power consumed in gaining operational status.

A82-12532 Photovoltaics, the solar electric solution. C. D. Beach and A. H. Litka (Florida Solar Energy Center, Cape Canaveral, FL). In The year of the Shuttle, Proceedings of the Eighteenth Space Congress, Cocoa Beach, FL, April 29-May 1, 1981.

Cocoa Beach, FL, Canaveral Council of Technical Societies, 1981, p. 3-36 to 3-41. 6 refs.

Direct conversion of solar energy to electricity by photovoltaic devices (solar cells) may be the most promising solution to the current energy problem. Photovoltaic energy systems provide a clean, simple method of energy conversion, and are reliable, safe, and flexible with respect to size (modular). The federal government is trying to commercialize photovoltaics by funding research on new materials and manufacturing processes. Earliest commercialization will be in residential systems, where the power grid back-up provides for a reliable electrical system without storage costs. The Florida Solar Energy Center has been operating a 5 kW experimental residential facility since 1980. The facility showed an average solar irradiance in the 62.5 sq m panels of 264 kw-hours/day from December 1980 through February 1981. The overall system efficiency was 7%, and the inverter operated with an ac output/dc input efficiency of 85-90%, depending on input levels

A82-12812 Theoretical analysis of the performance of a gravity-controlled solar concentrator. L Papa, G. A Rottigni (Genova, Università, Genoa, Italy), and C Ceccherini. Nuovo Cimento C, Serie 1, vol 4C, May-June 1981, p 284-294. 5 refs. Research supported by the Consiglio Nazionale delle Ricerche

Numerical calculations are presented of the performance of a solar concentrator with cylindrical parabolic symmetry, fixed focal axis, and a variable density reflector, the curvature of which is determined by gravity and the density distribution. The actual performance of the concentrator is deduced from measurements of total and diffuse solar radiation taken from 1964 to 1973 at Genoa, a city characterized by a typically maritime climate. The quantity of energy gathered by the solar collector is shown to be highly variable due to fluctuations in solar input, averaging 990 thermal kWh/sq m per year and in reasonable agreement with predictions based on a hypothesis of one clear day followed by one completely overcast day. Comparison of the geometrical concentration factors of purely gravity controlled solar concentrators with those of variable-density gravity controlled concentrators also demonstrates the advantages of the variable-density devices, which outweigh the supplementary costs associated with the provision for variable density by the suspension of chains under the reflecting surface

A82-12817 A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell. R. Radojcic, A. E. Hill, and M. J. Hampshire (Salford, University, Salford, England). Solar Cells, vol. 4, Sept. 1981, p. 109-120. 14 refs.

A numerical model of a graded bandgap CdS-CdTe solar cell is developed and used to optimize the design of an n-CdS(x)Te(1-x) - p-CdS(0.5)Te(0.5) thin film cell. The advantage of using a bandgap graded in the direction of thickness is the elimination of surface recombination losses by use of the window effect. The CdS-CdTe system was chosen because of the potential for thin film processing. The assumptions underlying the understanding of the CdS(x)Te(1-x) - CdS(0.5)Te(0.5) cell structure are given and a theoretical analysis is included. The photon flux is included as a function of photon energy by representing the solar spectrum as 100 discrete monoenergetic beams which are represented as numerical information in a computer. The energies are absorbed at some point within the graded bandgap layer, and an analytic description is furnished to describe

the distribution of photogenerated carriers in a graded layer. Thickness can be optimized by varying it proportionally with the bandgap; an optimal value of the base layer bandgap was found to be 1.35 eV. It is concluded that a graded bandgap device can be 1.8 times as efficient as a nongraded structure due to the lower reverse leakage current and greater fill factor in the graded device. M.S.K.

A82-12818 Preparation and properties of graded band gap CdS/x/Te/1-x/ thin film solar cells. R. Radojcic, A. E. Hill, and M. J. Hampshire (Salford, University, Salford, England). Solar Cells, vol. 4, Sept. 1981, p. 121-126. 9 refs.

The manufacture and experimental investigation of the properties of a thin film graded CdS(x)Te(1-x) solar cell are described. Graded CdS(x)Te(1-x) layers were vacuum co-deposited at a fixed rate of 20 A/sec by a shuttered method, in alternating layers of CdS and CdTe, to form an interdiffuse homogeneous CdS(x)Te(1-x) layer. Indium was added as a dopant to control the impurity concentration. Optical transmission of the films verified that the built-in field was stable, and a p-n barrier was found to exist. Photovoltages were measured to be 300 mV, but a SnO2 coating caused a resistance high enough to preclude measurement of the photocurrent. A combination of the window effect and a built-in field was observed, and the wide spectral response, particularly in the blue wavelengths, confirmed the theoretical predictions. Finally, copper was rejected as a contact electrode because of the tendency of its atoms to migrate along the grain boundaries and form trapping states and resistive paths. M.S.K.

A82-12819 Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells. A. P. Genis, C. Osterwald, J. E. Mahan, and J. B. Dubow (Colorado State University, Fort Collins, CO). Solar Cells, vol. 4, Sept. 1981, p. 127-133. 17 refs.

Indium tin oxide-Si solar cells of 20 8 sq cm area and 9.2% total area efficiency were fabricated on polycrystalline substrates. The cell fabrication sequence is described, with particular attention to the formation of an adherent low resistance front-contact grid based on a solder-dipping process. A detailed series resistance analysis of the structure is given, the sheet resistance of the indium tin oxide layer is measured by a voltage-probing technique and is found to be the dominant series resistance component for the specific grid pattern used.

(Author)

A82-12820 Effect of annealing CdS on a sintered CdS/Cu2S solar cell. K. Mukhopadhyay and H. Saha (Kalyani, University, Kalyani, India). Solar Cells, vol. 4, Sept. 1981, p. 135-146. 16 refs. Research supported by the Indian National Science Academy.

The effects of varying different parameters of formation on the performance and degradation of sintered CdS/Cu2S solar cells is described. CdS layers of 15 mm diameter and 0.8 mm thickness were formed after sintering at 800 C for 3 hr in an inert atmosphere, and then etching with HCl H2O. Four equal pieces were cut with three sintered at 200 C, one in vacuum, one in argon, and one in air; the fourth was not annealed. The CdS layers were studied by scanning electron microscopy, and the resistivity and mobility by a perpendicular four-probe arrangement. Cells were formed and capacitancevoltage measurements taken at room temperature. Annealing in argon and air was found to decrease the resistivity and increase the mobility, whereas annealing in vacuum increased both the shortcircuit current and open-circuit voltage, and increased the fill factor by a factor of about 1.74. Also, vacuum annealing decreased Cu diffusion to a minimum, leading to an almost complete elimination of degradation. M.S.K.

A82-12821 ZnO - p-InP heterojunction solar cells. K. P. Pande and C. N. Manikopoulos (Rutgers University, Piscataway, NJ). Solar Cells, vol. 4, Sept. 1981, p. 147-152. 9 refs.

The formation of ZnO-p-InP heterojunctions by means of a reactive evaporation technique for the deposition of ZnO is reported. ZnO is highly regarded as a window layer because of its low sheet resistivity, high transparency, and large energy gap (3.2 eV). The p-InP fabrication is described, and the Zn layer was formed by pumping the chamber pressure down to one-millionth torr, bleeding in oxygen at 10 mtorr, evaporating Zn in a crucible by resistive heating, and activating a glow discharge to form a ZnO layer on the InP substrate. Annealing took place at 250 C for 2 min in an argon

atmosphere, yielding a ZnO layer with a conductivity of 72 ohm/cm and more than 85% transparency. I-V curves are plotted, capacitance-voltage data are reported, and photovoltaic properties are graphed and discussed, noting that recombination centers are expected to be eliminated with further optimization of the ZnO layer. The cells had a 6.6% efficiency and series resistance of 30 ohms.

M.S.K.

A82-12822 Photoelectrochemical behaviour of CdS/Na1.3.3NH3 /liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion. D. Guyomard, M. Herlem (Paris, Ecole Supérieure de Physique et de Chimie Industrielles, Paris, France), R. Heindl (CNRS, Laboratoire d'Etude des Matériaux par des Techniques Avancées, Meudon, Hauts-de-Seine, France), and J.-L. Sculfort (CNRS, Laboratoire d'Electrochimie Interfaciale, Meudon, Hauts-de-Seine, France). Solar Cells, vol 4, Sept 1981, p. 157-167. 26 refs. Direction des Recherches, Etudes et Techniques Contract No 79-1210.

A liquid Nal.3.3NH3 solution was used as the medium in a photoelectrochemical cell to stabilize the working of CdS photoanodes and results are reported. The reference voltage of in situ Ag-Ag(plus) electrodes in the Nal.3 3NH3 solution is 0.27 V. The CdS samples were polished with diamond paste, rinsed in distilled water, and etched with HCI; ohmic contacts were formed on the backs with an evaporated gold and indium coating. Cyclic voltammetry was used to measure the electroactivity range, and a depletion layer was determined to exist in the space charge layer when an anodic current was found with reverse bias. High sensitivity to daylight was found, and this is attributed to the etching treatment and reactions to bulk energy levels. The addition of iodine to the solution was found to stabilize the photocurrent with a simultaneous rise in acidity, the iodine eventually vanishes unless the NH4(plus) is above 0.5 M or when the pH is near zero. An overall efficiency of 2 percent is noted, and the stabilization due to iodine presence resulted in cell operation for over a month. MS,K.

A82-12823 A practical method of analysis of the current-voltage characteristics of solar cells. J. P. Charles (Tunis, Ecole Nationale d'Ingénieurs, Tunis, Tunisia), M. Abdelkrim, Y. H. Muoy (Faculté des Sciences, Tunis, Tunisia), and P. Mialhe (Ecole Normale Supérieure, Dakar, Senegal). Solar Cells, vol. 4, Sept. 1981, p. 169-178. 15 refs.

A numerical method suitable for use with a programmable calculator is developed for determining the current-voltage (I-V) equation parameters of a solar cell driven as a generator only. The exact magnitude of the photocurrent is found and the fill factor is deduced. High and low quality Si solar cells were studied under illumination from a 12 V lamp in AM1 conditions. I-V curves are plotted for varying diode quality factors and the fill factors were analytically examined. Series resistance, shunt resistance, photocurrent, series current, and diode quality factors were calculated from the experimental data of the fourth quadrant characteristic for an ideal cell and results are diagrammed with performance data from the test cells. A flow chart is provided for the operations of the program. The quality factor is found to be dominant, unless significant output losses are encountered, and then series and shunt resistances gain effect. M.S.K.

A82-12824 V205-Si photovoltaic cells. J. Gobrecht, R. Nottenburg, K. Chewey, and S. Wagner (Solar Energy Research Institute, Golden, CO). *Solar Cells*, vol. 4, Sept. 1981, p. 179-186. 13 refs.

The results of experimentation of the preparation of V2O5 films for solar cells is presented. The V2O5 films were prepared in three ways (1) a powder was annealed directly on a Si wafer; (2) 0.02 M solutions of V2O5 in 5N HCl were applied directly with a dropper; and (3) the solution was misted on substrates heated to about 200 C. I-V characteristics, film resistivities, and C-V measurements were made under AM1 conditions, and the use of a forming gas was found to decrease the sheet resistivity. Evidence was found for an interfacial barrier and Auger electron spectroscopy indicated the presence of a silicon rich oxide layer, but the thickness was not determined. A reaction of V2O5 with Si was demonstrated at different formation temperatures. Adding a dopant such as H2 annealing at 600 C lowered the interface resistance from 1 k-ohm/cm to 2 ohm/cm; however, increasing the barrier conductance did not

increase either the short circuit current or open circuit voltage, factors which yet preclude practical use of the V2O5-Si cell. M.S.K.

A82-12825 Temperature dependence of the short-circuit current in MIS solar cells. S. K. Krawczyk, A. Jakubowski, and M. Zurawska (Warszawa, Politechnika, Warsaw, Poland). Solar Cells, vol. 4, Sept. 1981, p. 187-194. 14 refs.

A theoretical study of the temperature dependence of the short-circuit current (Isc) in MIS solar cells, particularly Al-SiO2 p-Si, is presented. A current flow model is developed, assuming a small potential drop across the dielectric layer, no fast surface states at the Si-SiO2 interface, and device thickness much larger than the minority carrier diffusion length. Negligible series resistance and shunt conductance, and no temperature dependence by either the energy gaps in Si or SiO2, or the minority carrier lifetime, or the absorption coefficient were also assumed. The behavior of lsc as a function of temperature is explained by a displacement of the quasi-Fermi levels at the semiconductor surface, and changes in Isc are caused by increase in the recombination and diffusion currents with increasing temperature. Fabrication procedures for the MIS cells are provided. It is noted that the effective dielectric thickness is different from the measured dielectric thickness, and further work is indicated to determine the effect of oxidation conditions on this thickness. M.S.K.

A82-12949 High-temperature solar central receivers. A. C. Skinrood (Sandia National Laboratory, Livermore, CA). Sunworld, vol. 5, July 1981, p. 97-104.

Designs and concepts for solar central receiver thermal power plants are reviewed. Concentrations of over 1,000 suns are now possible, and seven prototype plants, producing from 1-10 MWe, are close to completion, employing cavity and external receiver configurations. Heat transfer fluids are discussed, noting that the water/steam cycle is emerging as the dominant mode, liquid sodium is benefitting from extensive testing for nuclear power plants, molten salt provides thermal storage at \$10-30/kWt-hr; high temperature gas systems (815 C) can be applied for gypsum board drying and NH3 production. Heliostats are all of a steel/glass configuration and require mass production to become economical. Thermal storage systems, applications for repowering in conjunction with conventional power plants, and cogeneration for electricity/process heat are examined, and power costs are projected to match those of coal if the central receiver construction costs can be halved. D.H.K.

A82-12950 Solar perspectives - Israel, solar pond innovator. S. Winsberg, *Sunworld*, vol 5, July 1981, p 122-125

Existing and planned solar pond electricity producing power plants in Israel and California are discussed. Salt ponds, with salinity increasing with depth, are coupled with low temperature, organic working fluid Rankine cycle engines to form self-storage, nonpolluting, electric plants. Average pond thermal gradients range from 25 C surface to 90 C at the bottom; 160 GW of potential power have been projected as currently available from existing natural solar ponds from a partial survey of 14 countries. The largest installation to date has a 220 kW output, and a 5 MW plant is scheduled for completion in 1983. Efficiencies of 10% and a cost of \$2,000/kW for a 40 MW plant are projected, a cost which is comparable to that of conventional plants. The 40 MW plant is an optimized design, allowing for modular plant additions to increase capacity.

A82-13083 The effect of non-Markovian cloud patterns on the design of a regulator for a solar-powered boiler. D D. Sworder (California, University, La Jolla, CA) and K. L. Zondervan (Aerospace Corp., Guidance and Control Div., El Segundo, CA). In: Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1.

New York, American Institute of Chemical Engineers, 1981. 2 p. (WA-3F). NSF Grant No. ECS-80-80-03547, Contract No. DE-ACO3-78ET-20517.

This paper provides the regulator synthesis equations for the steam temperature regulator in a solar-powered boiler. The primary source of disturbance is produced by the motion of clouds across the field of mirrors which focus solar energy on the boilers. To permit flexibility in describing a variety of cloud conditions, the cloud model is non-Markov.

(Author)

A82-13199 Oxide optimization at the p-Si/aqueous electrolyte interface. H. J. Lewerenz, M. Lübke (Max-Planck-Gesellschaft zur Förderung der Wissenschaften, Fritz-Haber-Institut, Berlin, West Germany), K. J. Bachmann (North Carolina State University, Raleigh, NC), and S. Menezes (Bell Telephone Laboratories, Inc., Murray Hill, NJ). Applied Physics Letters, vol. 39, Nov. 15, 1981, p. 798-800. 22 refs.

A combination of surface chemical and voltammetric treatments have been used to optimize the stability and performance of p-Si/v(2+)-v(3+)4MHCI/C solar cells. B-doped Si electrodes exposing a (100) face to the electrolyte, a spectroscopically pure C counterelectrode and a saturated calomel electrode were used in a 3-electrode potentiostatic arrangement A power conversion efficiency of 6.1% under 60-mW/cm sq illumination was recorded S.C.S.

A82-13200 Thin-film gallium arsenide homojunction solar cells. S. S. Chu, T. L. Chu, F. S. Zhang, L. Book, and J. M. Yu (Southern Methodist University, Dallas, TX). Applied Physics Letters, vol. 39, Nov. 15, 1981, p. 803-805. 5 refs. Contract No. X50-9002-3.

Thin film homojunction GaAs solar cells of p(+)/n/n(+) configuration were deposited on tungsten-coated graphic substrates by the reaction of gallium, hydrogen chloride, and arsine containing approriate dopants. Solar cells with an area of 8 cm sq and an AM1 efficiency of about 7% were produced. The observed low fill factor is caused by grain boundary shunting and high series resistance. The cells are characterized by dark and illuminated current voltage and quantum efficiency measurements.

S.C.S.

A82-13284 Chromatic aberration effect on solar energy systems using Fresnel lenses. E Lorenzo (Madrid, Universidad Politécnica, Madrid, Spain) Applied Optics, vol 20, Nov 1, 1981, p. 3729-3732 12 refs

A82-13285 Luminescent solar concentrators. II - Experimental and theoretical analysis of their possible efficiencies. J S. Batchelder, T. Cole (California Institute of Technology, Pasadena, CA), and A H. Zewail. *Applied Optics*, vol 20, Nov. 1, 1981, p. 3733-3754. 12 refs. Research supported by the U.S. Department of Energy and ARCO Solar, Inc

Experimental techniques are developed to determine the applicability of a particular luminescing center for use in a luminescent solar concentrator (LSC). The relevant steady-state characteristics of eighteen common organic laser dyes are given. The relative spectral homogeneity of such dyes are shown to depend upon the surrounding material using narrowband laser excitation. Three independent techniques for measuring self-absorption rates were developed, these are time-resolved emission, steady-state polarization anisotropy, and spectral convolution. Preliminary dye degradation and prototype efficiency measurements are included. Finally, simple relationships are given relating the efficiency and gain of an LSC to key spectroscopic parameters of its constituents

A82-13713 † Investigation of the possibility of using inexpensive concentrating systems in the modules of a photoelectric station (K issledovaniiu vozmozhnosti ispol'zovaniia deshevykh kontsentriruiushchikh sistem v moduliakh fotoelektricheskoi stantsii). F. A. Akhmedov, Sh. Z. Mirtursunov, and R. A. Muminov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). Geliotekhnika, no. 4, 1981, p. 10-13. In

The use of various types of inexpensive concentrators in a solar power station with GaAs-Al(x)Ga(1-x)As cells and single-axis sun tracking is discussed. An analysis is presented of the dependence of the total efficiency of a module on the level of concentration, and of the distribution of radiation intensity in the focal plane for various types of concentration.

B.J.

A82-13715 † Analysis of the optical characteristics of solar collectors (Analiz opticheskikh kharakteristik solnechnogo kollektora). O. S. Popel', S. E. Frid, and E. E. Shpil'rain (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). *Geliotekhnika*, no. 4, 1981, p. 27-32. 5 refs. In Russian.

The influence of the optical characteristics of a collector on its efficiency is investigated. It is shown that the optical thickness of the transparent coating has the determining influence on the maximum

efficiency of the collector. The effects of solar-radiation incidence angle, dust contamination, and shadowing on the efficiency of the collector are also examined.

B.J.

A82-13716 † Production and certain properties of photoelectric cells based on silicon epitaxial structures (Poluchenie i nekotorye svoistva fotoelektricheskikh preobrazovatelei na osnove epitaksial'nykh struktur kremniia). M. S. Saidov, B. M. Abdurakhmanov, R. Aliev, and V. P. Chirva (Akademiia Nauk Uzbekskoi SSR, Institut Elektroniki, Tashkent, Uzbek SSR). Geliotekhnika, no. 4, 1981, p. 33-38, 8 refs. In Russian.

The feasibility of using silicon epitaxial structures of p(+)-n, n(+)-p, and p-p(+) types as photoelectric-cell materials is evaluated. The basic characteristics of such cells are investigated, including volt-ampere, load, and spectral characteristics, and the dependence of these characteristics on temperature and illumination intensity. It is concluded that such epitaxial structures can be successfully used as solar-cell materials.

B.J.

A82-13717 † System of tolerances for a solar-tower power station (Sistema dopuskov dlia SES bashennogo tipa). R. R. Aparısi and D. I. Tepliakov (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR) *Geliotekhnika*, no. 4, 1981, p. 39-44. 8 refs. In Russian.

The principles underlying the establishment of a system of tolerances for a solar-tower station are presented. Attention is given to static and dynamic tolerances and deviations for a single heliostat, and geometrical tolerances for a field of heliostats.

B.J.

A82-13718 † Mathematical simulation model for the operation of the optical system of a solar power station (Matematicheskaia imitatsionnaia model' raboty opticheskoi sistemy SES). I. V Baum (Akademia Nauk Turkmenskoi SSR, Institut Ispol'zovaniia Solnechnoi Energii, Turkmen SSR). Geliotekhnika, no. 4, 1981, p. 45-52. In Russian.

A82-13737 Amorphous silicon bibliography - Introduction, A. H. Mahan and J. L. Stone (Solar Energy Research Institute, Golden, CO). Solar Cells, vol 4, Oct. 1981, p. 205, 207-267, 269-291 (50 ff.). 1964 refs.

A bibliography of works about amorphous silicon is presented. It includes works published during the 1977-1980 period. Among the topics covered in the papers are (1) photoelectrochemistry of hydrogenated amorphous silicon, (2) laser annealing of hydrogenated amorphous silicon, (3) electronic hopping transport in disordered materials, (4) tunneling in hydrogenated amorphous silicon, and (5) the frequency-dependent dielectric behavior of amorphous silicon thin films.

A82-13803 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition.

L. M Fraas (Chevron Research Co , Richmond, CA). *Journal of Applied Physics*, vol 52, Nov 1981, p. 6939-6943 11 refs.

A new technique for multilayer growth by metalorganic chemical vapor deposition is described. The vacuum metalorganic chemical vapor deposition technique combines the low-temperature growth capability of molecular beam epitaxy with the source handling system of chemical vapor deposition. The viability of the new technique is demonstrated by the growth of high-mobility layers of GaAs, GaAs(1-x)P(x), and Ga(1-x)In(x)As at 570 C. Room-temperature mobilities of GaAs films as high as 4990 sq cm/V s are obtained. Doping of both p-type and n-type films is demonstrated. GaAs shallow homojunction solar cells fabricated with this technique are described. Active-area solar cell efficiencies as high as 19.6% are obtained with 6 'suns' AM2 concentrated light. This multilayer growth technique is particulary suited to the fabrication of multicolor solar cells.

A82-13804 Dependence of minority carrier diffusion length on illumination level and temperature in single crystal and polycrystalline Si solar cells. P. C. Mathur, R. P. Sharma, P. Saxena (Delhi, University, Delhi, India), and J. D. Arora (Delhi, University, Delhi; Hindu College, Moradabad, India). Journal of Applied Physics, vol. 52, Nov. 1981, p. 6949-6953. 29 refs.

A82-13805 Investigation of the performance of an . MoS2/I-/I2/C electrochemical solar cell. R. Audas and J. C. Irwin (Simon Fraser University, Burnaby, British Columbia, Canada). Journal of Applied Physics, vol. 52, Nov. 1981, p. 6954-6960. 19 refs Research supported by the British Columbia Science Council.

The performance of an electrochemical solar cell with a single crystal of MoS2 in an I(-)/I2 electrolyte has been investigated. An efficiency greater than 5% has been obtained by carefully cleaving the crystal to ensure a good quality surface, and by optimizing the electrolyte concentration. The cell performance has been compared to the predictions of a phenomenological model that incorporates a term representing a diffusion overvoltage. Excellent agreement with the experimental results has been obtained with two free parameters, representing the shunt and series resistance of the cell. (Author)

A82-13806 Low frequency capacitance characterizations on indium/x-phase of metal free phthalocyanine solar cells. Y. H Shing and R. O. Loutfy (Xerox Research Center of Canada, Mississauga, Ontario, Canada). *Journal of Applied Physics*, vol. 52, Nov. 1981, p. 6961-6964. 11 refs. Research supported by the National Research Council of Canada.

A82-14001 * # Dish concentrators for solar thermal energy-Status and technology development. L D Jaffe (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2530, 11 p. 8 refs

Comparisons are presented of point-focusing, or 'dish' solar concentrator system features, development status, and performance levels demonstrated to date. In addition to the requirements of good optical efficiency and high geometric concentration ratios, the most important future consideration in solar thermal energy dish concentrator design will be the reduction of installed and lifetime costs, as well as the materials and labor costs of production. It is determined that technology development initiatives are needed in such areas as optical materials, design wind speeds and wind loads, structural configuration and materials resistance to prolonged exposure, and the maintenance of optical surfaces. The testing of complete concentrator systems, with energy-converting receivers and controls, is also necessary. Both reflector and Fresnel lens concentrator systems are considered.

A82-14002 * # Buffer thermal energy storage for a solar Brayton engine. H J. Strumpf and K P. Barr (AiResearch Manufacturing Company of California, Torrance, CA) American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2531. 10 p. Contracts No NAS7-100; No. JPL-955136.

A study has been completed on the application of latent-heat buffer thermal energy storage to a point-focusing solar receiver equipped with an air Brayton engine. To aid in the study, a computer program was written for complete transient/stead-state Brayton cycle performance. The results indicated that thermal storage can afford a significant decrease in the number of engine shutdowns as compared to operating without thermal storage. However, the number of shutdowns does not continuously decrease as the storage material weight increases. In fact, there appears to be an optimum weight for minimizing the number of shutdowns. (Author)

A82-14003 * # Development, solar test, and evaluation of a high-temperature air receiver for point-focusing parabolic dish applications. E. J Hanseth (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2532. 8 p. 5 rofs.

A high temperature solar receiver was fabricated and tested in excess of 1370 C on an 11-meter-diameter test bed concentrator at the Jet Propulsion Laboratory Parabolic Dish Test Site, Edwards, California. The 60-kilowatt thermal receiver design utilizes state-of-the-art silicon carbide honeycomb matrix panels to receive and transfer the solar energy and mullite elements for thermal buffer storage. Solar tests were conducted with indicated air exit temperatures ranging from 885 C (1625 F) to 1427 C (2600 F), mass flow rates of 75 to 105 g/sec (0.16 to 0.23 lbm/sec), and pressures up to

265 kPa absolute (38 4 psia) Estimates of efficiency are 59.7% at 1120 C (2048 F) to 80.6% at 885 C (1625 F) when aperture spillage losses are considered separately. Results are presented which demonstrate the feasibility of this innovative receiver concept for point-focusing parabolic dish applications over a wide temperature range. (Author)

A82-14004 : Feasibility of solar assisted ethanol production. M L. Holden, A N. Shekar, and T. F. Smith (Iowa, University, Iowa City, IA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec 1-3, 1981, Paper 81-2533. 9 p 15 refs. Research supported by the Iowa Energy Policy Council and U.S. Department of Energy.

Interest in alternative liquid fuels is growing due to the increasing scarcity and cost of conventional fuels. One such alternative is ethanol fuel. A positive energy balance associated with production of ethanol fuel, however, has been a point of concern. Utilizing 'free' solar process energy can displace non-renewable fuels and produce a more favorable energy balance. The purpose of this study is to ascertain the feasibility of a solar assisted ethanol fuel production system utilizing a simulation model. System sensitivity to collector area, configuration, and type along with ethanol fuel production rate, distillation pressure and temperature, and thermal energy storage size are examined. (Author)

A82-14005 * # Solar concentrator panel and gore testing in the JPL 25-foot space simulator. E W Dennison and M. J. Argoud (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2534, 7 p

The optical imaging characteristics of parabolic solar concentrator panels (or gores) have been measured using the optical beam of the JPL 25-foot space simulator. The simulator optical beam has been characterized, and the virtual source position and size have been determined. These data were used to define the optical test geometry. The point source image size and focal length have been determined for several panels. A flux distribution of a typical solar concentrator has been estimated from these data Aperture photographs of the panels were used to determine the magnitude and characteristics of the reflecting surface errors. This measurement technique has proven to be highly successful at determining the optical characteristics of solar concentrator panels. (Author)

A82-14013 # Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential. W. E. Fraize and J. Gordon (Mitre Corp., McLean, VA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2550. 10 p. 5 refs. Contract No. DE-AC01-79ET-21047.

Cost goals for solar thermal technologies are being reviewed and updated by the U.S. Department of Energy. This paper describes a methodology for determining cost goals for electric utility and industrial applications. The methodology consists of. (1) estimating break-even capital or delivered energy cost to the users; (2) incorporating the economic and financial analysis that may be employed by the potential user, and (3) relating break-even costs to potential market size as a basis for setting cost goals. The approach to cost goals presented here is not technology dependent. As a result, it can be applied to any emerging technology and can be used to develop consistent cost targets across a number of diverse technologies. (Author)

A82-14014 # A method for preliminary evaluation and sizing of solar thermal cogeneration system applications. J. T. Ator (Aerospace Corp., Energy and Resources Div., El Segundo, CA) American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2551 14 p. 20 refs.

A simplified system model has been found helpful in evaluating proposed solar cogeneration applications. The necessary data base includes mean daily insolation and average daily loads for each month. A combination of direct and stored solar thermal energy, purchased power, and heat energy derived from organic fuels is included in the modeling to ensure 24-hour effectiveness in meeting

all thermal and electrical loads. The effect of varying collector field size on total annual displacement of fossil energy is determined without the complexity of hour-by-hour simulation. An application to a hypothetical large military base is presented to illustrate the method.

(Author)

A82-14015 * # Use of ceramics in point-focus solar receivers.

R. H. Smoak and A. A. Kudırka (Calıfornia Institute of Technology, Jet Propulsion Laboratory, Applied Mechanics Div., Pasadena, CAI. American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2552. 10 p. 16 refs. Research sponsored by the U.S. Department of Energy and NASA.

One of the research and development efforts in the Solar Thermal Energy Systems Project at the Jet Propulsion Laboratory has been focused on application of ceramic components for advanced point-focus solar receivers. The impetus for this effort is a need for high efficiency, low cost solar receivers which operate in a temperature regime where use of metal components is impractical. The current status of the work on evaluation of ceramic components at JPL and elsewhere is outlined and areas where lack of knowledge is currently slowing application of ceramics are discussed. Future developments of ceramic processing technology and reliability assurance methodology should open up applications for the pointfocus solar concentrator system in fuels and chemicals production, in thermochemical energy transport and storage, in detoxification of hazardous materials and in high temperature process heat as well as (Author) for electric power generation.

A82-14405 A simplified method for direct calculation of the annual load fraction of solar systems for space heating. M. M. Hawas and M. R Abou-Zeid (Garyounis, University, Benghazi, Libya). Energy (UK), vol. 6, Sept. 1981, p. 933-943 11 refs.

A82-14406 Thermal analysis of three zone solar pond. M. S. Sodha, N. D. Kaushik, and S. K. Rao (Indian Institute of Technology, New Delhi, India). *International Journal of Energy Research*, vol. 5, Oct.-Dec. 1981, p. 321-340. 20 refs.

A periodic analysis of a three zone solar pond as a solar collector and a heat storage medium is presented. The pond is modelled as having an upper convective zone, a middle nonconvective layer, and a lower convective zone. The walls are insulated, and the bottom is blackened, and salt concentrates in the middle zone, with increasing density downwards. Solar short wave radiation passes through to the bottom and is absorbed, while IR rays penetrate only a few cm. Six harmonics are used as a representation of the periodic variation of atmospheric temperature and solar intensity. The Fourier heat conduction equation for the nonconvective region is solved explicitly, and the convective heat and mass flux through the pond is accounted for. Reflective losses and radiation attenuation with depth are approximated by use of an effective extinction coefficient. Numerical results are obtained which indicate an increase of efficiency with temperature, leveling off at 5% at a collection temperature of 90 C.

A82-14445 Contributions of space reflector technology to food production, local weather manipulation and energy supply, 1985-2020. K. A. Ehricke (Space Global Co., La Jolla, CA). British Interplanetary Society, Journal (Space Technology), vol. 34, Dec. 1981, p. 511-518.

The parameters and uses of orbital space reflectors to redirect measured amounts of solar radiation to selected areas of the earth are discussed. Two systems, Lunetta - night illumination, and Soletta - solar level irradiation, are considered, noting that solar level reflectance is over a thousand times brighter than moonlight. Optimized orbits, reflective angles, and mirrored surfaces are explored for controlling the image size and location. Soletta applications are envisioned for weather modification, as a source of night time power for electrical generation, and to enhance biomass growth; Lunetta reflectors may be used for urban, polar, and rural illumination, and as a light source for disaster and rescue operations. A prototype Lunetta would have a 1,860 sq km area, with full scale models ranging from 18 to 50 times larger.

A82-14446 A technological approach towards future large solar arrays. B. Goergens (Space and New Technologies, Wedel, West Germany). British Interplanetary Society, Journal (Space Technology), vol 34, Dec. 1981, p. 519-526. 5 refs.

Developmental strategies for large solar arrays for future space missions are described, noting that enlargements for the near term will be dependent on the ability to interface with the Shuttle. Spacelab missions, currently scheduled for seven days duration, could be extended to 30-90 days if power was available. Higher cell efficiencies, deployable blanket technology, space based mass production of solar cells, and capabilities to handle high voltages are listed as priorities for solar cell development. A comparison is made between technologies for solar and terrestrial solar cells, and mention is made of 100 micron thick cells, 5 x 5 sq cm cells, back field cells, and back reflective surface cells for space applications. A 50 kW array with foldable deployment, high voltage technology, and the success of welded cells are outlined.

A82-14667 Gallium-arsenic-antimony heterojunction photocells. V. M. Andreev, N. S. Zimogorova, O. O. Ivent'eva, V. I. Myrzin, and S. P. Troshkov. (Pis'ma v Zhurnal Tekhnicheskoi Fiziki, vol. 7, Feb. 12, 1981, p. 132-135.) Soviet Technical Physics Letters, vol. 7, Feb. 1981, p. 56, 57, 8 refs. Translation.

A study of heterojunction solar cells with a narrow-gap GaAs(1-x)Sb(x) layer and a wide-gap GaAs window is reported. Photocurrent spectra of these heterojunction structures is presented. The attainment of reverse breakdown voltages of 25-30 V in the diodes shows that it is possible to produce structures in which the lattice mismatch of the substrate and the narrow-gap layer will have a minimal effect on the properties of the p-n junction.

A82-14846 # Optimization of flow passage geometry for air-heating, plate-type solar collectors. K. G. T. Hollands and E. C. Shewen (Waterloo, University, Waterloo, Ontario, Canada). ASME, Transactions, Journal of Solar Energy Engineering, vol. 103, Nov. 1981, p. 323-330. 11 refs. National Research Council of Canada Contract No. 125Q31155-7-4409.

Rectangular and triangular duct air flow solar collectors are analyzed to determine the optimum configuration for the flow passages. The pressure drop and mass flow rates are assumed to be specified values, and a uniform heat flux boundary condition is used to define the upper surface. A model for heat transfer in a flow in an infinite passage is considered, and it is shown that once the channel length is chosen, all other terms become fixed. The forced convective heat transfer is found to depend on the length of the channel in the collector. A design for a short-path collector is presented, where manifolds constrain air flow to half of the collector width in any one passage, and a lower limit to passage width is obtained as 2 mm. The V-groove collector offers higher efficiencies than the flat plate-type by 7-12% m and the optimal flow length is found at 0.5 m minimum.

A82-14847 # Material property data and their use in design and analysis for an elevated temperature solar code. I. Berman (Foster Wheeler Development Corp., Livingston, NJ). ASME, Transactions, Journal of Solar Energy Engineering, vol. 103, Nov. 1981, p. 345-350, 20 refs.

Specific properties of the materials, temperatures, and operating parameters for elevated temperature solar thermal power plants are considered as a basis for developing standards of implementation. Physical and mechanical properties such as thermal conductivity, elastic modulus, expansion, strength, and creep are discussed and recommendations for ASME Code I and III materials are cited where feasible. Inelastic behavior tests involving beam bending, pipe ratcheting, torsion-torsion tests, and axial cyclic tests of various stainless steel specimens and Incoloy 800 material are reported. Peculiarities of problems for solar applications are noted to be a lack of information of basic material behavior due to the low amount of actual operational experience, a large number of transient temperature cycles, and primary creep.

A82-15006 # Silicon and gallium arsenide photovoltaic cells
- Models for the functioning, experimentation, and application to
concentrating collectors (Les cellules photovoltaiques au silicium et à
l'arseniure de gallium - Modèles de fonctionnement, experimentation

et application aux généateurs sous concentration). F. Therez. Toulouse III, Université, Docteur d' Etat Thesis, 1980. 198 p. 68 refs. In French.

Theoretical and experimental studies are reported for the use of Si and GaAs monocrystalline solar cells in concentrator configurations. Behavior of the cells' structures are examined, and homojunction (HJ) and heterojunction (HTJ) cells are explored for the effects on the electrical properties caused by larger sizing. Analytical models are developed to show that diffusion and conduction are the pertinent mechanisms for current-voltage characteristics of HJ and HTJ cells, and concepts of Auger recombination and reduction of the width of the forbidden band are introduced. A numerical model is presented for optimization of nonconcentrating systems, and a two-dimensional study is made of concentrating systems to establish a design for the cover of the concentrator. Finally, bicolor cells involving the bonding of SI and GaAs cells are considered, with efficiencies provided based on relations to monolithic and multispectral cells. M.S.K.

A82-15111 Sputtered thin film electrodes for photoelectrochemical cells. A. A. Soliman and H. J. J. Seguin (Alberta, University, Edmonton, Canada). Canadian Journal of Physics, vol. 59, Nov. 1981, p. 1674-1679. 14 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada and Imperial Oil Corp.

Semiconducting TiO2 film photoelectrodes were prepared by do sputtering from a simple hot pressed TiO2 powder target. To make the target semiconducting, it was first heated in a hydrogen atmosphere. Films so produced on heated glass substrates were polycrystalline and strongly adhered to the substrates. When tested for photoelectrolysis, these films were chemically stable and did not exhibit any photodecomposition. The spectral response was investigated and a main absorption edge at about 400 nm was obtained. The technique appears attractive for inexpensive large scale production of photoelectrodes for solar-hydrogen conversion. (Author)

A82-15112 Current-voltage characteristics of semiconductor-electrolyte junction solar cells. F. El Guibaly and K. Colbow (Simon Fraser University, Vancouver, Canada). Canadian Journal of Physics, vol. 59, Nov. 1981, p. 1682-1685. 15 refs.

An improved model for the semiconductor-electrolyte solar cell is discussed. Charge transfer kinetics, surface recombination, recombination in the quasi neutral region and in the depletion region, as well as the series and shunt resistance of the cell are included in the model. It is shown that the surface transfer velocity of minority carriers across the semiconductor-electrolyte interface affects primarily the open circuit voltage, the fill factor and power conversion efficiency, and only to a lesser degree the short circuit current. As is the case with nonelectrolyte solid state cells, the series resistance of the electrochemical cell reduces the fill factor and the conversion efficiency, while the shunt resistance reduces the open circuit voltage of the cell in addition to reducing the fill factor and the power conversion efficiency. (Author)

A82-15439 Colloidally deposited high-temperature solar selective surfaces. J. J. Zybert and D. R. McKenzie (Sydney, University, Sydney, Australia). Applied Optics, vol. 20, Dec. 1, 1981, p. 4051-4053. 11 refs.

Thin, colloidally deposited coatings with uniform thickness for solar selective surfaces are described. A 200 nm Cu film was deposited on glass by vacuum evaporation in an electron beam coating chamber. A second layer of colloidally suspended Si and C was deposited by slowly withdrawing the copper-coated substrate from the colloidal dispersion; uniform thicknesses of 200 and 480 nm were obtained. Reflectance was in the 1-1.5 micron region and emittance (highest for thickest coatings) levelled off after baking at 400 C. The film withstood 600 C temperatures for 200 with no loss in absorptance, compared to a 2% loss after 500 C for 100 hr for both vacuum evaporated cermets and sputter deposited titanium silicide coatings. Further improvements are predicted by the use of colloids with higher volume fractions of silica and lower concentrations of carbon.

M.S.K.

A82-15441 An analytical model for high-low-emitter /HLE/ solar cells in concentrated sunlight. W.-Z. Shen and C.-Y. Wu (National Chiao Tung University, Hsinchu, Republic of China).

Solid-State Electronics, vol. 24, Nov. 1981, p. 1025-1037. 21 refs. Research supported by the National Science Council of the Republic of China.

A current-voltage characteristic is derived for the high-low emitter solar cell in concentrated sunlight. For high-level injection, the ambipolar approach is used to yield the complete information of the low emitter concentration region, including the ohmic drop, the Dember voltage, the minority carrier current density, the minority-carrier distribution, and the electric field distribution. High doping effects including Auger recombination and bandgap narrowing are considered. The dependences of short-circuit current, open-circuit voltage, fill factor, and conversion efficiency on the variations of the geometrical dimensions and material parameters are discussed in detail for silicon single crystal materials. It is shown that the maximum conversion efficiency of 22% at 100 suns (AMO) can be obtained for silicon high-low emitter solar cell. (Author)

A82-15442 A pinhole model for metal-insulatorsemiconductor solar cells. A. Rothwarf (Drexel University, Philadelphia, PA) and I. Pereyra (Delaware, University, Newark, DE). Solid-State Electronics, vol. 24, Nov. 1981, p. 1067-1070. 22 refs. Contract No. DE-AC01-79ET-23107-01.

Based upon a consideration of the standard theory of MIS solar cells and the experimental results on such devices, the concept of tunneling through the thin insulating layer as the controlling mechanism is rejected. In place of the tunneling mechanism the concept of parallel Schottky diodes through pinholes in the insulator is proposed. The mathematical formulation fits this proposal. The characteristics and limits of efficiency expected for such a pinhole MIS are explored and found to be in good accord with existing results on experimental diodes. The equations needed to specify the density and size of the pinholes needed for optimal efficiency are formulated but not solved. A suggestion to test the hypothesis by artificially producing pinhole devices is proposed. (Author)

A82-15444 Effect of junction depth on the performance of a diffused n/+/p silicon solar cell. P. C. Dhanasekaran and B. S. V. Gopalam (Indian Institute of Technology, Madras, India). Solid-State Electronics, vol. 24, Dec. 1981, p. 1077-1080. 17 refs.

A82-15447 Theory of back surface field silicon solar cells. S. R. Dhariwal (Government College, Ajmer, India) and A. P. Kulshreshtha (Indian Space Research Organization, Satellite Centre, Bangalore, India). Solid-State Electronics, vol. 24, Dec. 1981, p. 1161-1165. 12 refs. Research supported by the Department of Space and Space Commission.

A theory has been developed which explains the behavior of back surface field (BSF) silicon solar cells with n+pp+ or p+nn+ structure. The theory is based on the calculation of the open circuit voltage of a BSF cell by considering the charge neutrality condition with drift of both the majority and minority carriers, whereas previous theories have emphasized the flow of minority carriers alone. It is shown that the open circuit voltage of a BSF cell is almost independent of the base layer resistivity at high levels of injection. It is also shown that the enhancement of the open circuit voltage of a high resistivity cell is more apparent in n+pp+ than in p+nn+ structure, because the former gives lower voltages in the non-BSF structure.

A82-15607 Bounds and exact theories for the transport properties of inhomogeneous media. R. C. McPhedran and G. W. Milton (Sydney, University, Sydney, Australia). Applied Physics A - Solids and Surfaces, vol. A 26, Dec. 1981, p. 207-220. 39 refs. Research supported by the Science Foundation for Physics.

The reported investigation is concerned with the transport properties of an inhomogeneous substance composed of two different materials, the composite being macroscopically homogeneous. The problem arises in connection with the calculation of the optical properties of cermets for solar energy applications. It is also important in mechanical engineering for the study of the properties of composites. Subclasses of the problem include the scalar and the vector case. The investigation is mainly concerned with scalar problems, taking into account rigorous methods. Attention is given to two approaches. One approach is concerned with the calculation

of bounds regarding the transport properties. The second approach involves a consideration of specific periodic structures and the exact solution of the transport problem. It is the principal aim of the investigation to demonstrate the unity of these two approaches. G.R.

A82-15642 † Method for calculating the unsteady temperature conditions of the generator in a solar refrigeration system (Metod rascheta nestatsionarnogo temperaturnogo rezhima generatora solnechnoi kholodil'noi ustanovki). B. M. Achilov, V. V. Chugunkov, and R. M. Mirzakhodzhaev (Bukharskii Gosudarstvenny) Pedagogicheskii Institut, Bukhara, Uzbek SSR). Akademiia Nauk Uzbekskoi SSR, Doklady, no. 8, 1981, p. 32-34. In Russian.

A82-15653 Calculation of the top loss coefficient by the network method and applications to solar collectors. T Muneer and M. Hawas (University of Garyounis, Benghazi, Libya). *Energy* (UK), vol. 6, Oct. 1981, p. 971-981. 10 refs.

A technique for the analysis of radiation exchange between two parallel planes with an intervening transmitting-absorbing-reflecting medium is extended to include convective heat transfer in the case of flat-plate solar collectors. The radiation exchange between the absorber plate of the collector and the sky is analyzed by a network method. Two network elements represent the surface and space resistances, which model the exchange of radiant energy between any two surfaces. The heat flow in each branch of the network is determined by application of Kirchhoff's Law to the circuit with the algebraic sum of the currents at each node set at zero. A flow chart is provided for the solution of the network, and radiosities and emissive powers are found for various plastic and glass covers including all paths of heat transfer loss. Top loss coefficients are derived and the method is proved reliable for calculation of the temperature of any cover and the heat exchange between two surfaces. M.S.K

A82-15660 Introduction of solar energy in Saudi Arabia A case study. A. I. El-Sharkawy (Kıng Abdulazız University, Jeddah, Saudi Arabia), A. A. Husseiny, and R. Kenarangui (Iowa State University of Science and Technology, Ames, IA) Journal of Engineering and Applied Sciences, vol. 1, no. 1, 1981, p. 41-55. 5 refs.

Policies for the introduction of solar energy in Saudi Arabia are examined. Differentiation is made between areas of low density (nomadic) and high density (urban) population. Five strategies are considered which encompass the evolution from overall dependence on fossil fuel to a total energy system solely based on solar energy. Use is made of the multiattribute utility theory in the decision analysis of the various strategies. (Author)

A82-15666 A solar heating system with annual storage. F. Lazzarı and G. Raffellını (Bologna, Università, Bologna, Italy). International Journal of Ambient Energy, vol 2, July 1981, p. 141-149.

A solar heated house with long term storage capability, built in Trento, Italy, is described. The one story house was built from modular components and has a total heated volume of 1130 cu m. Flat plate solar collectors with a water-antifreeze medium are located beneath the lawn, and six cylindrical underground tanks holding 130 cu m of water heated by thermal energy from the collectors are situated under the garden. The house walls have an 8 cm cavity filled with 5 cm of formaldehyde foam, yielding a heat transmission (U) of 037 W/sq m/deg C. The roof and ceilings are insulated with fiberglass and concrete, producing U-values of 0.46 W/sq m/deg C and 0.57 W/sq m/deg C, respectively. Heat pumps using 6 kW move thermal energy between the house and the tanks. Direct hot water heating occurs in the summer, and direct home heating when the stored water temperature exceeds 32 C. A computer model was developed which traces the annual heat flow and it is shown that the system supplies all heating requirements for the house, with electrical requirements equal to 20 percent of the annual house needs. M.S.K

A82-15903 * Towards a high-temperature solar electric converter. G. J. Dunning and A. J. Palmer (Hughes Research Laboratories, Malibu, CA). *Journal of Applied Physics*, vol. 52, Dec. 1981, p. 7086-7091. 10 refs. Contract No. NAS2-10001.

The concept of an ultrahigh-temperature solar electric heatengine converter is examined in which an alkali plasma would serve as both the high-temperature collector of solar radiation and as the working fluid for a high-temperature working cycle. The working cycle would be a simple magnetohydrodynamic Rankine cycle. Theoretical and experimental results obtained to date are summarized. These include (1) an experimental confirmation of the theoretical prediction that a plasma temperature of about 2800 K can be reached through heating cesium vapor by sunlight concentrated to approximately 300 W per sq cm, and (2) the establishment of a theoretical model of the complete solar heated plasma magnetohydrodynamic cycle.

A82-15911 A new structure for a semiconductor-insulatorsemiconductor solar cell. K. Sen and R. S. Srivastava (D. B. S. College, Dehradun, India). *Journal of Applied Physics*, vol. 52, Dec. 1981, p. 7309-7312, 7 refs.

The open circuit voltage and short circuit current characteristics of S(p+n)IS, a new structure proposed for semiconductor-insulator-semiconductor solar cells, are calculated and compared with those of the S(n+)IS type solar cells. It is found that the theoretical conversion efficiency of the new structure with polycrystalline base is about 30% and its open circuit voltage is of the order of 1.3 V, which is much higher than for a polycrystalline S(n+)IS solar cell.

V.L

A82-16051 Grain size dependence of the photovoltaic properties of solar grade polysilicon. S Kumarı, N. K. Arora, and G. C. Jaın (National Physical Laboratory of India, New Delhi, India). Solar Energy Materials, vol. 5, Oct. 1981, p. 383-390, 20 refs.

The effect of grain size on the various photovoltaic and diode parameters of polycrystalline silicon solar cells is investigated. The grain size ranged from 0.3-3 mm, and the solar cells were fabricated on 22 mm diameter and 300 micron thick polycrystalline Si wafers with a resistivity of about 10 ohm cm. The solar grade polysilicon has an impurity concentration as high as 10 to the 16th - 10 to the 17th/cu cm, with iron as the major impurity. The variation of efficiency and diffusion length with grain size was found to shift to higher grain size ranges in solar cells made out of solar grade poly-Si. This is a result of the increased detrimental effects of grain boundaries in solar grade poly-Si, since the excess impurities segregate at the grain boundaries. A study of dark I-V characteristics shows that the grain boundaries do not appreciably affect bulk recombination, but do enhance the contribution of the space charge recombination.

A82-16053 Photoelectrochemical cells using polycrystalline and thin film MoS2 electrodes. G. Djemal, U. Lachish, D. Cahen (Weizmann Institute of Science, Rehovot, Israel), and N. Muller Solar Energy Materials, vol. 5, Oct. 1981, p. 403-416, 21 refs Research supported by the European Communities Energy Research and Development Program and U.S.-Israel Binational Science Foundation.

The preparation and preliminary characterization of a variety of photoactive polycrystalline MoS2 electrodes in polyiodide aqueous electrolyte are reported. The best photoresponse results were obtained when multicrystalline lumps were affixed to metal substrates, pressed pellets reached about 30% of the output of these electrodes. Thin polycrystalline films were prepared by flux annealing of pasted films, these showed some photoresponse, which was improved by more than an order of magnitude if an organic polymer binder was used in the preparation and retained by low temperature annealing. These electrodes reached 50% of the output of pressed pellets. The effect of the polymer is due to (1) orientation of the crystallites, and (2) shielding of some of the exposed edges from the solution. Prolonged use of these photoelectrodes or short use at higher temperatures will decrease their output, but the original activity can be restored by renewed low temperature annealing. The wavelength dependence of the photoresponse of these electrodes shows that those using a polymer matrix approach the performance of single crystals most closely

A82-16054 A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion. D. Casenave, R. Gauthier, and P. Pinard (Lyon, Institut National des Sciences Appliquées, Villeur-

banne, Rhône, France). Solar Energy Materials, vol. 5, Oct. 1981, p. 417-423. 10 refs. Research supported by the Centre National de la Recherche Scientifique and Agence Nationale de Valorisation de la Recherche.

A method of elaboration of polysilicon ribbons for solar energy conversion has been developed, which uses powder as a starting material. The method is characterized by its low energy costs, its high pulling rates, and its elimination of substrate contamination. Ribbons with small grains (of the order of 100 microns) are obtained in the first melting process from the powder. The ribbons are then recrystallized under an electron beam, giving elaborated polycrystalline samples with a columnar structure and an average thickness of 400 microns. Electron irradiation at low pressure leads to two simultaneous processes of purification, one resulting from the displacement of the molten zone produced on the sample by the electron beam, the other operating by evaporation of impurities in vacuum.

J.F.

A82-16055 Solar selective properties and high temperature stability of CVD ZrB2. E. Randich and R. B. Pettit (Sandia National Laboratory, Albuquerque, NM) Solar Energy Materials, vol. 5, Oct. 1981, p. 425-435 16 refs. Contract No DE-AC-04-76DP-00789

The aging at temperatures of 400, 500, and 600 C in air is examined for chemical vapor deposited (CVD) zirconium diboride (ZrB2) and zirconium diboride coatings overcoated with silicon nitride (Si3N4). The solar absorptance and emittance properties of polished CVD ZrB2 on high-density, hot-pressed ZrB2 are also reported. Antireflection coatings of Si3N4 increased the solar absorption of CVD ZrB2 from initial values of 0.46-0.77 to 0.88-0.93, while only increasing the emittance from 0.08 to 0.10. Aging tests show the Si3N4/ZrB2 combination, both free standing and on Kovar substrates, to be stable in air at 500 C for greater than 1000 h, but at 600 C, the emittance increased after 300 h exposure. This slow degradation at 600 C appears to result from oxidation of the Si3N4 antireflection layer.

A82-16056

Photocorrosion of strontium titanate photoanodes. C W de Kreuk, J L B. de Groot (Centrale Organisatie voor
Toegepast Natuurwetenschappelijk Onderzoek, Centraal Laboratorium TNO, Delft, Netherlands), and A Mackor (Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek, Organisch Chemisch Instituut TNO, Utrecht, Netherlands) Solar Energy
Materials, vol 5, Oct 1981, p 437-444 13 refs Research supported
by VEG-Gasinstituut.

The photocorrosion of a strontium titanate photoanode was studied under acidic (0.5 M H2SO4), neutral (0.5 M Na2SO4), and alkaline (1.0 M NaOH) conditions it was found that in the 0.5 M H2SO4 acid medium, SrTiO3 corrodes very rapidly upon band-gap irradiation (at a potential of 1.V) with an external bias. Assuming the photocorrosion to be a two-hole process releasing strontium ions, the corrosion corresponded to 10% of the photocurrent. No substantial corrosion was found in the dark or under open-circuit conditions. In the neutral medium, the corrosion was less severe, chipping of the crystal surface was observed (thickness of about 0.2-0.4 microns), due to the loss of strontium. No substantial corrosion was found under alkaline conditions.

A82-16057 Sputter etched metal solar selective absorbing surfaces for high temperature thermal collectors. G. L. Harding and M. R. Lake (Sydney, University, Sydney, Australia). Solar Energy Materials, vol. 5, Oct. 1981, p. 445-464, 31 refs. Research supported by the University of Sydney.

Magnetron sputter etching was used to successfully texture copper, stainless steel, and nickel in the form of sheets (280 mm x 50 mm) and tube (280 mm in length). The various surfaces exhibited absorptances in the range of 0.90 to 0.95 and emittances in the range of 0.10 to 0.25 at 300 K. In the case of copper surface morphologies and solar selectivity varied with sputter etching parameters, allowing tailoring of selective properties. Surfaces produced on stainless steel and nickel were less dependent on sputtering conditions. Sputteretched copper surfaces were stable in vacuum at 400 C, sputteretched stainless steel surfaces were stable at 500 C and deteriorated slowly in air at 400 C, surfaces based on nickel deteriorated slowly in air even at 300 C. Measurements of the dependence of absorptance on angle of incidence show that textured specimens produced by

sputter etching behave similarly to a highly specular sputtered selective surface. The magnetron sputtering techniques can also be extrapolated to produce solar absorbers having an axial length of about 2 m.

J.F.

A82-16124 Solar chemistry of metal complexes. H. B. Gray (California Institute of Technology, Pasadena, CA) and A. W. Maverick (Washington University, St. Louis, MO). *Science*, vol. 214, Dec. 11, 1981, p. 1201-1205. 41 refs.

Electronic excited states of certain transition metal complexes undergo oxidation-reduction reactions that store chemical energy. Such reactions have been extensively explored for mononuclear complexes. Two classes of polynuclear species exhibit similar properties, and these complexes are now being studied as possible homogeneous sensitizer-catalysts for hydrogen production from aqueous solutions. (Author)

A82-16127 High efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride. R. Schorner and R. Hezel (Erlangen-Nurnberg, Universitat, Erlangen, West Germany) IEEE Transactions on Electron Devices, vol. ED-28, Dec. 1981, p. 1466-1469. 15 refs.

A82-16131 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells. J. A. Mazer (Harris Semiconductor, Inc., Palm Bay, FL), A. Neugroschel, and F. A. Lindholm (Florida, University, Gainesville, FL). *IEEE Transactions on Electron Devices*, vol ED-28, Dec. 1981, p. 1530-1534. 6 refs. Contract No. XS-9-8275-1

The method makes use of the fact that, in a solar cell for which the shifting approximation is valid, a constant series resistance, independent of illumination, will cause the light and dark I-V curves to be symmetrically displaced with respect to the I sub SC-V sub OC curve. This symmetry is analyzed in detail. The experimental data are seen as suggesting that the shifting approximation is valid and that the series resistance is independent of illumination up to at least one-sun intensity for a variety of polysilicon solar cells in which the intragrain-base minority carrier diffusion length is less than or equal to the average grain diameter.

C.R.

A82-16132 K/u/-band flat-profile Si-IMPATT diodes with 10-percent efficiency. D. Leistner and J Freyer (Munchen, Technische Universität, Munich, West Germany). *IEEE Transactions on Electron Devices*, vol ED-28, Dec 1981, p 1553, 1554. 8 refs. Research supported by the Fraunhofer Gesellschaft zur Förderung der angewandten Forschung.

A82-16133 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells. A Cuevas, J Eguren, E Sanchez, and M Cid (Madrid, Universidad Politécnica, Madrid, Spain) IEEE Transactions on Electron Devices, vol. ED-28, Dec 1981, p 1554, 1555. 5 refs.

A82-16229 # Thermal performance of a solar still. M. S Sodha, J. K. Nayak, G. N. Tıwari (Indian Institute of Technology, New Delhi, India), and U. Singh. *Journal of Energy*, vol. 5, Nov.-Dec. 1981, p. 331-336. 19 refs.

A simple periodic analysis of a basin-type solar still (both single as well as double), mounted on a stand, has been presented. The effect of dye injected into the water of a single-basin still has been explained. Numerical calculations have been carried out using parameters corresponding to stills with which experiments have been carried out at the Indian Institute of Technology, Delhi, It is found that the present theory quite satisfactorily explains the thermal performance of basin-type solar stills. (Author)

A82-16247 An integrating sphere based on absolute method for measuring solar absorptance. X. Ge (China University of Science and Technology, Hefei, People's Republic of China) and Y. Peng (Chinese Academy of Sciences, Shanghai Institute of Ceramics, Shanghai, People's Republic of China) Engineering Thermophysics in China, vol. 1, Oct.-Dec. 1981, p. 347-366. 32 refs. Translation.

In this paper, an integrating sphere for measuring solar absorptance is described. Its characteristics are (1) it is an absolute

method, (2) it can be used to measure the directional-hemispherical reflectance for various incidence angles; (3) the samples to be measured may be specular, diffuse or specular-diffuse reflecting surfaces. Theoretical analyses are carried out for this integrating sphere and the measured data of reflectance of the MgO, vacuum-vaporized aluminum mirror film and other surfaces are presented.

(Author)

A82-16249 Natural convection in air layers at various aspect ratios and angles of inclination. D Luo and L. Han (Qinghua University, Beijing, People's Republic of China). Engineering Thermophysics in China, vol. 1, Oct.-Dec. 1981, p. 385-397. 17 refs. Translation.

The results of an experimental investigation of natural convection in air layers at various aspect ratios and angles are presented. The Rayleigh numbers range from subcritical to 1,000,000; the angle of inclination, measured from the horizontal, ranges from 0 to 90 deg. From an analysis of the physical model and the experimental measurements, several experimental nondimensional formulas are proposed. Special attention is given to the influence of the aspect ratio on heat transfer. The influence is found to differ with the range of the aspect ratio, being more pronounced in the range of low aspect ratios. The applicability of the recommended relationships to the design of solar collectors is stressed.

A82-16469 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates. T L Chu, S. S. Chu (Southern Methodist University, Dallas, TX), L. L. Kazmerski, R Whitney (Solar Energy Research Institute, Golden, CO), C. L Lin, and R. M. Davis (Poly Solar, Inc., Garland, TX). Solar Cells, vol. 5, Dec. 1981, p. 29-38. 7 refs Contract No. XZ-0-9192-1.

A preparation of acid extracted metallurgical grade silicon as a large-grain substrate for solar cells is described. Metallic impurities which normally accumulate on the grain boundaries of pulverized Si were removed by 400 hr of aqua regia refluxing Secondary ion mass spectrometry (SIMS) revealed that aluminum and iron concentrations were significantly reduced, and the Si was made into sheets by unidirectional solidification on an RF-heated graphite plate. Solidification at 1-2 cm/min yielded a (110) crystallite orientation, SIMS determined that remaining impurities were uniformly diffuse, and heat treatment in He at 700 C resulted in precipitation of metallic impurities onto the grain boundaries. Trichlorosilane was thermally reduced to form an epitaxial film on the Si substrate, and 37 sq cm cells were fabricated with an efficiency of 8.95%.

A82-16471 n-/indium tin oxide//p-InP solar cells. L. Gouskov, H. Luquet, J. Esta, and C. Gril (Montpellier II, Université, Montpellier, France). Solar Cells, vol. 5, Dec. 1981, p. 51-66. 17 refs.

n-(indium tin oxide)/p-InP solar cells of 11 percent efficiency were fabricated using the spray method to deposit indium tin oxide onto single-crystal p-type InP. For the atomic ratio Sn:In of 1:10, the optimized spray temperature is 450 C. The various characterizations made on this type of device give results which are in good agreement with a buried homojunction model. (Author)

A82-16472 Effects of double-exponential current-voltage characteristics on the performance of solar cells. A. H. M. Shousha (United Arab Emirates University, Al Ain, United Arab Emirates). Solar Cells, vol. 5, Dec. 1981, p. 67-73. 10 refs

The effects of double-exponential dark current-voltage characteristics on the open-circuit voltage, fill factor and conversion efficiency of solar cells were investigated with reference to MIS solar cells. The results presented show various types of cell performance depending on the relative contributions of the postulated current transport mechanisms.

(Author)

A82-16474 Effects of processing parameters on thick film inks used for solar cell front metallization. K. Firor and S. Hogan (Solar Energy Research Institute, Golden, CO). Solar Cells, vol. 5, Dec. 1981, p. 87-100. 9 refs.

A study is described of commercially available thick film conductor inks to determine their suitability for use as solar cell front electrical contacts. By varying processing parameters such as firing profile and length of HF etch, most of the silver-based inks were found to form good electrical contacts. Irrespective of ink

composition, adjustment of processing parameters is necessary to optimize the performance of a thick film solar cell contact. The base metal conductor inks tested were found to be unsuitable for solar cell front metallization. The two major problems encountered were high diffusivities in silicon and high series resistances introduced by the base metal contacts.

(Author)

A82-16598 A seasonally adjusted concentrator with modifications of absorber shape, S. C. Mullick and S. K. Nanda (Indian Institute of Technology, New Delhi, India) Applied Energy, vol. 9, Dec. 1981, p. 257-266, 14 refs

A design procedure for a solar collector absorber is described, which avoids the optical losses which occur through the air gap. A comparison of the performance results of this modified absorber with those of a plane tubular absorber shows an improvement in the intercept factor from 0.8 to 0.92. The surface area of the modified absorber is about 9% larger than the surface of the plane tubular absorber, but the shape is such that the overall heat loss factor is much lower: the total heat loss for the modified absorber at 100 C above ambient is only 0.2% higher than that of the plane tubular one. Performance curves of both absorbers are given, demonstrating the improved efficiency of the modified absorber.

A82-16599 Theoretical analysis of the Fresnel lens as a function of design parameters. P. K Gupta (Indian Institute of Technology, New Delhi, India). Applied Energy, vol. 9, Dec. 1981, p. 301-310. 7 refs.

The theoretical performance of the Fresnel lens was studied as a function of the design parameters - i.e., the radius to the center of the steps, the focal distance from the back of the lens to the plane of the image with the object (i.e., the sun) at infinity, the thickness of the lens plate, the step width and the refractive index of the material (with respect to air) - used in its fabrication. Numerical calculations have also been carried out for a Fresnel lens of perspex sheet.

(Author)

A82-16742 Photoanode on the base of pheophytinsensitized reactions. E lu. Kats, lu. N. Kozlov, and B A. Kıselev (Academy of Sciences, Institute of Photosynthesis, Pushchino, USSR). Energy Conversion and Management, vol. 21, no 3, 1981, p 171-174, 18 refs.

A model of a photoelectrochemical fuel element for photoionized reduction of methylviologen is presented, along with experimental results. The photoanode is described on a basis of pheophytin-sensitized oxidation of manganese ions, with tetranitromethane used as an irreversible electron acceptor. Use of a platinum electrode and preparation of the chemical redox agents is described, and a polarographic cell at 20 C illuminated by a 750 W iodine lamp was investigated. The addition of water or Mn ions to the solution in the photogalvanic cell led to total tetranitromethane reduction. The pheophytin-sensitized reduction of MN ions permitted an open current voltage of 750 mV and a short circuit photocurrent of 100 micro-A/sq cm. The recombination of reaction products is inhibited by the irreversible tetranitromethane reduction, which is a drawback for use of the system.

A82-16744 Optimization of heat losses in normal and reverse flat-plate collector configurations - Analysis and performance. M. Madhusudan, G. N. Tiwari, D. S. Hrishikeshan, and H. K. Sehgal (Indian Institute of Technology, New Delhi, India). Energy Conversion and Management, vol. 21, no. 3, 1981, p. 191-198. 6 refs

A82-16745 Nickel sulphide-lead sulphide and nickel sulphide-cadmium sulphide selective coatings for solar thermal conversion. M. Madhusudan and H. K. Sehgal (Indian Institute of Technology, New Delhi, India). Energy Conversion and Management, vol. 21, no. 3, 1981, p. 199-204. 6 refs.

A82-17098 * Low cost silicon-on-ceramic photovoltaic solar cells. B G. Koepke, J. D. Heaps, B. L. Grung, J. D. Zook (Honeywell Corporate Material Sciences Center, Bloomington, MN), J. D. Sibold (Coors Porcelain Co., Golden, CO), and M. H Leipold (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). In Energy and ceramics.

Amsterdam, Elsevier

Scientific Publishing Co., 1980, p. 1146-1158. 23 refs. Research sponsored by the U.S. Department of Energy and NASA

A technique has been developed for coating low-cost mullite-based refractory substrates with thin layers of solar cell quality silicon. The technique involves first carbonizing one surface of the ceramic and then contacting it with molten silicon. The silicon wets the carbonized surface and, under the proper thermal conditions, solidifies as a large-grained sheet. Solar cells produced from this composite silicon-on-ceramic material have exhibited total area conversion efficiencies of ten percent. (Author)

A82-17099 The use of semiconducting oxide ceramics in solar energy conversion. I. R Bedwell and E. R. McCartney (New South Wales, University, Kensington, Australia). In Energy and ceramics.

Amsterdam, Elsevier Scientific Publishing Co., 1980, p. 1159-1172. 18 refs.

N-type oxide semiconductors in such forms as single-crystal slices and sintered compacts of rutile and hematite are studied, with a view to their use as photo-anodes in photogalvanic and photoelectrolytic solar cells. Slices of single-crystal hematite displayed anisotropic behavior in the photogalvanic mode, with higher currents obtained by an (012) slice than those having other orientations. Photoresponse variations were also found in hematite compacts, depending on the origin of the iron oxide used, and quantum efficiencies in the 1-5% range were measured. Other aspects of the research reported are: (1) AC and DC conductivity, (2) the effect of ohmic constant, (3) photocurrent as a function of bias voltage, and (4) long-term stability.

A82-17126 The design of a sodium-cooled 2.7 MW receiver for a solar power plant (Auslegung eines natriumgekuhlten 2,7 MW-receivers für ein Sonnenkraftwerk). D. Stahl, H. Weizenkamp (Interation Internationale Atomreaktorbau GmbH, Bensberg, West Germany), and H. Fricker (Gebruder Sulzer AG, Winterthur, Switzerland). Brennstoff-Warme-Kraft, vol. 33, Nov. 1981, p 451-454 In German.

The design of the sodium-cooled 2.7 MW receiver, installed at the solar power plant in Almeria, Spain, is described, Particular attention is given to the receiver requirements, its construction, and its thermodynamic and dynamic response to solar radiation. The receiver has a thermal output of 2.7 MW, maximum and minimal sodium flow rates of 7.34 kg/sec and 0.734 kg/sec, respectively, and sodium inlet and outlet temperatures of 270 C and 530 C. respectively. The geometry of the receiver includes an active thermally conducting wall, formed from a 120 deg portion of a vertical cylinder with a radius of 2.25 m and a height of 3.61 m, the maximum heat flux reaches a value of about 62 W/sq cm, the average being about 16 W/sq cm. The total thermal efficiency at 100% load is 88.3%, this efficiency decreases steadily, due to the constant sodium outlet temperature and the constant radiation, convection, and line losses. Out of sunlight, the receiver cools down from radiation losses of about 320 kW, the maximum temperature transient is about 2 k/sec.

A82-17128 Solar-thermal experimental projects on the Spanish Plataforma Solar (Solarthermische Versuchsvorhaben auf der spanischen Plataforma Solar). W. Grasse (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Cologne, West Germany). DFVLR-Nachrichten, Nov. 1981, p. 6-10. In German.

The Plataforma Solar with an area of 1,000,000 sq m is located in Spain at a distance of approximately 50 km from the Mediterranean. In May 1979, nine members of the International Energy Agency (IEA) decided to support the construction of Small Solar Power Systems (SSPS). The countries involved include West Germany, the U.S., Spain, and Italy. The SSPS are to demonstrate the operational feasibility of solar technologies which have been mainly developed in Germany and the U.S. In addition, data are to be obtained regarding the relative competitive position of two different operational concepts for SSPS. The concepts are related to the central receiver system (solar tower) and the distributed collector system. Attention is also given to the Spanish solar power station CESA-1 and the German-Spanish technology program GAST, which is to explore the technological limits of solar-energy systems. G.R.

A82-17252 Metallurgical analysis and high temperature degradation of the black chrome solar selective absorber. C. M. Lampert (California, University, Berkeley, CA). (Thin Solid Films, vol. 72, 1980, p. 73-81.) In Metallurgical coatings 1980, Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volume 1 Lausanne, Elsevier Sequoia, S.A., 1980, p. 73-81. 13 refs. Contract No W-7405-eng-48.

A commercially produced coating is used in scrutinizing the properties and degradation modes of black chrome that is exposed to high temperatures. Both asplated and annealed microstructural models are studied in the microstructural characterization, the technical means comprise scanning electron microscopy, transmission electron microscopy, Auger depth profiling, hemispherical reflectance measurements, and energy-dispersive X-ray analysis. From these results, a physical metallurgical model for the wavelength-selective properties of the coating is developed. It is found that black chrome degrades as Cr2O3 oxide particles grow and the chromium is depleted. The effect is pronounced in air, less noticeable in a medium vacuum. It is noted that oxidation by preferential diffusion and outgassing which causes structural changes may take place. C R.

A82-17253 Sputter-deposited Al2O3/Mo/Al2O3 selective absorber coatings. J. A Thornton, A. S Penfold, and J L. Lamb (Telic Corp., Santa Monica, CA) (Thin Solid Films, vol. 72, 1980, p. 101-109.) In Metallurgical coatings 1980, Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volume 1

Lausanne, Elsevier Sequoia, S.A., 1980, p. 101-109 16 refs Research supported by the U.S. Department of Energy

An investigation of Al2O3/Mo/Al2O3 (AMA) interference-type selective absorber coatings deposited by cylindrical magnetron sputtering onto low emittance molybdenum-coated glass and stainless steel substrates is presented. Both post- and hollow-cathode magnetrons were used The Al2O3 layers were formed by reactive sputtering from aluminum and by RF sputtering from alumina targets. The semitransparent molybdenum intermediate layers were deposited with and without oxygen injection. The optical constants for the individual sputtered layers were determined from transmission and reflectance measurements, and were used to calculate the influence of these layers on the solar absorptance of the complete AMA coating. The optical properties of the sputtered AMA layers were in reasonable agreement with theory, yielding hemispherical solar absorptances of 0 92-0.95 with total hemispherical emittances of 0 06-0 10 at 20 C. The highest absorptances and the lowest emittances were obtained for coatings in which the center molybdenum layer had been deposited with oxygen addition. The thermal stabilities of coatings with RF-sputtered Al2O3 were superior to those with reactively sputtered Al2O3. AMA coatings on stainless steel with an Al2O3 diffusion barrier were stable (less than 2% loss in absorptances) at 700 C in vacuum and at 550 C in air. These coatings are therefore attractive for a range of selective absorber applications, including high temperature collectors for use between 300 and 600 C (Author)

A82-17254 Characterization of selective solar absorber microstructures - Electron microscope studies. L. E. Murr, O. T. Inal, and M. Valayapetre (New Mexico Institute of Mining and Technology, Socorro, NM). (Thin Solid Films, vol. 72, 1980, p. 111-120.) In: Metallurgical coatings 1980, Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volume 1.

Lausanne, Elsevier Sequoia, S.A., 1980, p. 111-120. 8 refs. Contract No. ER-78-84-4266.

A82-17255 Oxidation of electrodeposited black chrome selective solar absorber films. P. H. Holloway, K. Shanker (Florida, University, Gainesville, FL), R. B. Pettit, and R. R. Sowell (Sandia National Laboratory, Albuquerque, NM). (Thin Solid Films, vol. 72, 1980, p. 121-128.) In Metallurgical coatings 1980, Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volume 1.

Lausanne, Elsevier Sequoia, S. A., 1980, p. 121-128. 15 refs. Contracts. No. DE-ACO4-76DP-00789, No. DE-FG02-79ER-10541

A82-17293 Aplanatic double reflection system for thermophotovoltaic applications - Design. F. Demichelis, E. Minetti-

Mezzetti (Torino, Politecnico, Turin, Italy), and G. Ferrari (Fiat S.p.A., Centro Ricerche, Turin, Italy). *Applied Optics*, vol 20, Dec. 15, 1981, p. 4190-4192.

An aplanatic double-reflection concentrator which is relatively inexpensive and provides a highly concentrated output beam has been developed for applications in thermophotovoltaic solar energy systems. The configuration consists of a spherical primary reflector and a field of Fresnel mirror secondary reflectors deployed on a spherical surface so that the Abbe sine condition is satisfied, eliminating both spherical aberration and coma. Optical analysis of such a system has resulted in the design of a solar collector for a thermophotovoltaic converter which concentrates a power of 1000 W on the absorber through an aperture of 0.01 m, and has demonstrated its suitability for high-temperature solar systems.

A.L W

A82-17294 Finite Lambertian source analysis of concentrators - Application to solar reflectors. A. Luque and J. M. Gómez (Madrid, Universidad Politécnica, Madrid, Spain). Applied Optics, vol. 20, Dec. 15, 1981, p. 4193-4200. 6 refs

The Lambertian source characteristics of solar reflectors operating in concentrating collectors are considered. The figures of merit of a given concentrator are analyzed with respect to its behavior in casting the incident power into the collector (intercept factor) and its ability to illuminate the collector as a Lambertian source (shape quality factor), and it is shown that the maximum power is cast on the collector when the concentrator is seen as a Lambertian source. The intercept factor of ideal mirrors, defined as those mirrors casting all received rays onto the receiver, are examined in the case of inaccuracies in concentrator shape, and it is found that all outlines become Lambertian when the tracking error is high enough. A method for cost analysis is presented which leads to the conclusion that mirrors with quality factors close to the Lambertian should be used for high-cost collectors, while mirrors with intercept factors close to those of the ideal should be used if the concentrator cost is high.

A82-17649 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-SI:H, solar cells. R. S. Crandali (RCA Laboratories, Princeton, NJ). RCA Review, vol. 42, Sept. 1981, p. 441-457. 16 refs. Research supported by RCA; Contract No. XG-0-9372-1.

Measurements of the photoconductive response of Schottky barrier and p-i-n solar cell structures made from hydrogenated amorphous silicon are presented to compare the properties that determine their efficiency. It is demonstrated that the photoconductivity determines the fill factor rather than the dark current, as in crystalline silicon cells. Analysis of the current voltage curves of the p-i-n cells are used to show that the electron and hole drift lengths are of the same order in the i layer of the cell. (Author)

A82-17650 Field nonuniformity due to photogenerated carriers in a p-i-n solar cell. R. S. Crandall (RCA Laboratories, Princeton, NJ). RCA Review, vol. 42, Sept. 1981, p. 458-462. 10 refs. Research supported by RCA; Contract No. XG-0-9372-1.

The changes in the electric field due to the free-carrier space charge in a p-i-n solar cell are calculated. A criterion for significant field reduction caused by space charge is presented. It is suggested that there will be significant electric field lowering for hydrogenated amorphous silicon, a-Si:H, solar cells much thicker than 1 micron under 1 sun illumination.

(Author)

A82-17761 # The El Paso electric 20-kilowatt photovoltaic system. V. V. Risser and S. Durand (New Mexico Solar Energy Institute, Las Cruces, NM). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0064. 8 p.

Features and operational characteristics of a 20 kW flat plate photovoltaic power system are described. The system powers computers which control a combined cycle 190 MW power plant. Performance has been an average of 93 kWh/day, 6.05% efficiency, and at an average cell temperature of 22 C from Dec. 1980 to Sept. 1981. The array comprises 279 sq m area, 64 panels, 6 subarrays for subsystem shorting if necessary, and fuses set at 250 V with a reaction time of 10 microsec. Testing procedures are outlined,

including data acquisition, weather monitoring, operation in cloudy periods, and fault isolation modes. Maintenance has been dominated by upkeep of the data acquisition system, and it is noted that significant reductions in all maintenance would have results in only minor reductions in overall system performance.

M.S.K.

A82-17762 # The Mt. Laguna photovoltaic project. L. R. Suelzle (Helionetics, Inc., Irvine, CA) and D. E. Haskins (Sandia National Laboratory, Albuquerque, NM). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL. Jan. 11-14, 1982, Paper 82-0065. 7 p. 6 refs.

The Mt. Laguna 60 kW photovoltaic project was completed and placed in operation in June of 1979. During the first two years of operation the photovoltaic system has met or exceeded most of the technical requirements originally established with virtually no problems. The electrical output from the photovoltaic array however, has suffered a slow but consistent decline during the 2-year operational period. Fortunately, the load on the grid has declined at a still greater rate so that the percentage of the load carried by the photovoltaic system has increased from 10% to about 20%. This paper addresses the 2 years of operations and analyzes the overall performance and effectiveness of the system during that time.

(Author)

A82-17764 # The Lea county electric 100-kilowatt gridconnected photovoltaic system. V. V. Risser and P. Hutchinson (New Mexico Solar Energy Institute, Las Cruces, NM). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0067. 7 p.

A 100-kilowatt flat-plate grid-connected photovoltaic system, funded by the Department of Energy, was installed in Lovington, New Mexico. The system is composed of two 50-kilowatt subfields, each with a dedicated power conditioning unit. A subfield contains 21 subarrays, 80 modules each. Oriented due south, the total panel area of 1,685 square meters may be adjusted manually to 10, 30, or 40 degrees from horizontal. System performance and weather information is collected and analyzed by New Mexico Solar Energy Institute. Performance data is checked daily and fault detection techniques are used if string current degradation is noted. The system has operated automatically since March 17, 1981. Reliability of prime system components has been high. This paper reviews results to date and examines system performance from a user's viewpoint.

(Author)

A82-17765 # Startup experience with a concentrating photovoltaic power system. S. I. Kaplan (Oak Ridge National Laboratory, Oak Ridge, TN). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0068. 5 p. Contract No. W-7405-eng-26.

Physical features and startup characteristics of a 240 kW parabolic trough photovoltaic power system are described. The Mississippi County Community College array (Blytheville, AR) comprises 45 rows of linear parabolic troughs oriented N-S, which track E-W by means of a hydraulically driven actuator. The solar input is focussed onto 50/50 water-glycol cooled receiver bars on which Si solar cells are mounted. Nominal operating temperature for the cells is 50 C, with the heat transferred to the building heat supply in the winter. The output is routed through a power conditioning unit for inversion to 480 V ac power, for use by the school or, when the demand is exceeded, for direct transmission into the utility grid. Problems during startup have included misalignment, due to gravitational torquing and twisting, standoff insulation, and tracking during cloudy periods. Output has been 45% of design during the autumn of 1981.

M.S.K.

A82-18025 Electric utility modeling extensions to evaluate solar plants. J. T. Day and M. J. Malone (Westinghouse Electric Corp., Pittsburgh, PA). *IEEE Transactions on Power Apparatus and Systems*, vol. PAS-101, Jan. 1982, p. 120-124; Discussion, p. 125, 126, 12 refs.

It is pointed out that solar concepts, such as solar thermal electric and photovoltaic conversion plants, which use direct sunshine, have operating characteristics that cannot be adequately handled with conventional generation planning models. The simula-

tion methodology employed considers a separate detailed solar operation model which is interfaced with conventional utility generating planning models to determine the operating and reliability impact of solar plants on a utility system. Attention is also given to optimal utility expansion extensions. The operation of a 100 MWe central receiver solar-thermal power plant on a synthetic utility system representative of the southwest U.S. is considered.

G.R.

A82-18222 * # High performance solar Stirling system. J. W. Stearns (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) and R. Hagiund (Advanco Corp., El Segundo, CA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2554. 6 p. 10 refs. NASA-supported research.

A full-scale Dish-Stirling system experiment, at a power level of 25 kWe, has been tested during 1981 on the Test Bed Concentrator No. 2 at the Parabolic Dish Test Site, Edwards, CA. Test components, designed and developed primarily by industrial contractors for the Department of Energy, include an advanced Stirling engine driving an induction alternator, a directly-coupled solar receiver with a natural gas combustor for hybrid operation and a breadboard control system based on a programmable controller and standard utility substation components. The experiment demonstrated practicality of the solar Stirling application and high system performance into a utility grid. This paper describes the design and its functions, and the test results obtained. (Author)

A82-18223 * # Configuration selection study for isolated loads using parabolic dish modules. W. Revere, J. Bowyer, T. Fujita, and H. Awaya (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2549. 11 p. 10 refs. Research sponsored by the U.S. Department of Energy and NASA.

A configuration tradeoff study has been conducted to determine optimum solar thermal parabolic dish power systems for isolated load applications. The specific application of an essentially constant power demand as required for MX missile shelters is treated. Supplying a continuous level of power with high reliability is shown to require a power system comprising modular parabolic dish power units where the heat engines of the modular power units can be driven by fossil fuels as well as solar-derived heat. Since constraints on reliability result in the provision of a power generating capability that exceeds the constant demand level, efficient utilization of the power system requires battery storage. Tradeoffs regarding the optimum size of storage are investigated as a function of the number of power modules and the cost of the fossil fuel which is used to meet the demand when insolation is unavailable and storage is depleted. (Author)

A82-18232 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage (Résolution théorique et numérique d'un modéle mathématique de déstockage de l'énergie solaire). H. Ghidouche, F. Lavainne, and N. Point (Paris XIII, Université, Villetaneuse, Seine-Saint-Denis, France). In: Numerical methods for engineering; Proceedings of the Second International Congress, Paris, France, December 1-5, 1980. Volume 1.

Paris, Dunod, 1980, p. 369-382. In French.

Solutions of a mathematical model describing the recovery of solar energy stored as heat in a pebble bed are presented in the one- and two-dimensional cases. Fluid and pebble temperatures, and fluid pressure, velocity and density are obtained as functions of time and position for a pebble bed storage unit heated to a temperature of 70 C and releasing its heat to air at 20 C over the course of 6 months. The problem is treated numerically using different time scales for the pebbles and the fluid. In the one-dimensional case, the advancement of the energy release front is found to correspond to experimental observations.

A.L.W.

A82-18287 * Effects of low temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells. S. S. Li, T. T. Chiu (Florida, University, Gainesville, FL), and R. Y. Loo (Hughes Research Laboratories, Malibu, CA). (IEEE,

U.S. Defense Nuclear Agency, NASA, and DOE, Annual Conference on Nuclear and Space Radiation Effects, 18th, Seattle, WA, July 21-24, 1981. J IEEE Transactions on Nuclear Science, vol. NS-28, Dec. 1981, p. 4113-4118. 15 refs. Grant No. NsG-1425.

The GaAs solar cell has shown good potential for space applications. However, degradation in performance occurred when the cells were irradiated by high energy electrons and protons in the space environment. The considered investigation is concerned with the effect of periodic thermal annealing on the deep-level defects induced by the 200 keV protons in the AlGaAs-GaAs solar cells. Protons at a fluence of 10 to the 11th P/sq cm were used in the irradiation cycle, while annealing temperatures of 200 C (for 24 hours), 300 C (six hours), and 400 C (six hours) were employed. The most likely candidate for the E(c) -0.71 eV electron trap observed in the 200 keV proton irradiated samples may be due to GaAs antisite, while the observed E(v) +0.18 eV hole trap has been attributed to the gallium vacancy related defect. The obtained results show that pariodic annealing in the considered case does not offer any advantages over the one time annealing process.

A82-18471 Model based studies of some optical and electronic properties of narrow and wide gap materials, N. M. Ravindra, K. S. Kumar, V. K. Srivastava (Roorkee, University, Roorkee, India), and R. P. Bhardwaj. *Infrared Physics*, vol. 21, Nov. 1981, p. 369-381. 26 refs. Research supported by the Council of Scientific and Industrial Research and University Grants Commission of India.

Studies are reported concerning the optical and electronic properties of narrow and wide gap materials in the groups IV, V, VI, III-V, II-VI, I-VII, IV-VI, and IV-IV, with emphasis on the high-frequency dielectric constant and its related properties. The relevance of this work to solar cells is discussed, and a comparative assessment of the models proposed by Penn (1962), Van Vechten (1969), Breckenridge et al. (1974) and Grimes and Cowley (1975) is presented. It is found that, although all of the models give adequate. estimates of the Penn gap, none of them are universally applicable. In addition, studies are presented of the temperature and pressure dependence of the Penn and energy gaps and the high frequency dielectric constant, followed by an evaluation of the electron-phonon contribution to the total temperature dependence of the energy gap and the refractive index. The inverse square law governing the variation of deformation potential with the lattice parameter is found to be valid for a large number of semiconductors. 0.0

A82-18645 # Application of solar power satellites to India's energy needs - A macroengineering solution to a macroproblem. J. P. Vajk (Science Applications, Inc., Pleasanton, CA). In: Macroengineering: The rich potential; Proceedings of the Third Symposium, San Francisco, CA, January 6, 1980. (A82-18643 06-99) New York, American Institute of Aeronautics and Astronautics, 1981, p. 97-109, 12 refs.

It is proposed that Solar Power Satellites (SPSs) be used as the primary energy source for the synthesis of methanol, which is easily transported, and may be derived from water and from carbon dioxide extracted from the air. In order to meet the household energy needs of India in this way at the turn of the century, 200 SPSs of 5 GW capacity each would be required. The construction and operation of the 2000 synthesis plants to which the SPS power would be transmitted by laser or microwave beam would (1) alleviate India's rural unemployment, (2) stimulate the development of economic infrastructures and a skilled labor force in rural areas, (3) reduce family energy expenditures, and (4) decrease pressures on the natural environment by providing a cheaper substitute for firewood and dried animal manures.

A82-18697 † The universal plane method for calculating the dimensions of heliostate (Metod universal noi plostosti dito reschero geberitov geliostate). L. B. Perres and I. V. Baum (Akademiia Nauk Turkmenskoi SSR, Institut Solnechnoi Energii, Turkmen SSR). Akademiia Nauk Turkmenskoi SSR, Izvestiia, Seriia Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk, no. 5, 1981, p. 57-61. In Russian.

It is pointed out that heliostat dimensions are crucial in ensuring that sunlight is properly reflected during the day in solar furnaces

and solar power stations. In determining these dimensions, allowance must be made for changes in the sun's position during the day, changes which depend on the latitude of the installation. To construct unique algorithms for calculating the dimensions, a procedure involving general concepts must be formulated and this formulation introduces a universal frame of reference. An example of this which has attracted considerable interest involves a flat round receiver that is parallel either to the horizontal plane or to the universal plane considered here.

C.R.

A82-18698 † Thermal deformation of concentrators in an entisymmetric temperature field (Termodeformatsii kontsentratorov v antisimmetrichnom temperaturnom pole). R. Bairamov, V. M. Korolev, Iu. I. Machuev, A. Nazarov, E. V. Sokolov, and V. G. Fokin (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). Akademiia Nauk Turkmenskoi SSR, Izvestiia, Seriia Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk, no. 5, 1981, p. 67-72. 5 refs. In Russian.

Attention is given to skew-symmetric temperature deformations. It is noted that deformations of this type occur when the temperature of the middle surface of the mirror and when the temperature gradient of the thickness vary according to a certain law, which is given. Such a temperature distribution arises when the optical axis of the mirror does not coincide with the direction of the radiant heat flux. Expressions are given which make it possible to determine the deviations of points on the reflecting surface from the theoretical profile. The deformed surface obtained can be approximated by a paraboloid having parameters (focus distance and the direction of the optical axis) which differ from the original values.

C.R.

NTIS

DOE

Avail

A82-18816 A simplified model of the thermohydraulic bahaviour of a linear collector natwork for the conversion of the sclar energy. C. Bellecci, M. Camarca, M. Conti, L. La Rotonda, S. Natoli, G. Piccini, and R. Visentin (Calabria, Università, Cosenza, Italy). Nuovo Cimento C, Serie 1, vol. 4C, July-Aug. 1981, p. 385-396. 6 refs.

A model has been set up to describe the thermohydraulic behavior of a solar power plant in a quasi-steady-state approach; the simplifying assumptions have been proved to be correct. The model has been solved to determine the optimum sizes of the thermal accumulator.

(Author)

N82-10276# Mid-American Solar Energy Complex, Minneapolis, Minn

QUARTERLY REPORT OF SOLAR FEDERAL BUILDINGS PROGRAM IN THE WASEC REGION

Jun. 1981 20 p (Contract DE-AC02-79CS-30150)

(DE81-027968, MASEC-R-81-059/1)

agencies projects are briefly described

HC A02/MF A01

Solar Federal Buildings Program (SFBP) projects within the 12-state MASEC region are listed. The states involved are Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. The SFBP

N82-10490 Southern Methodist Univ., Dallas, Tex
THIN-FILM POLYCRYSTALLINE CADMIUM TELLURIDE
SOLAR CELLS AND LARGE-AREA POLYCRYSTALLINE
SILICON SOLAR CELLS Ph.D. Thosis
Roshdy Abolazayem Abderrassoul 1981 139 p

Avail. Univ Microfilms Order No. 8117882

Device quality polycrystalline films were deposited on a tungsten-coated graphite substrate by chemical vapor deposition An in-situ indium layer was deposited prior to CdTe deposition to reduce the back resistance Indium and iodine were used for n-type doping, and arsenic and phosphorus were used for p-type doping. The structural and electronic properties of the films were evaluated Post-deposition heat treatment in a cadmium overpressure reduced the electrical resistivity by a factor of 2-3. Large-area purified metallurgical silicon substrates on graphite were prepared by unidirectional solidification. The moving-coil zone-melting technique was used. The pulverized metallurgicalsilicon was acid-treated and phosphoruspentoxide gettered prior to recrystallization, in order to reduce the content of harmful

metallic impurities, especially Al and Fe A spectrophotometric technique was used to determine the iron content in the acid-treated silicon

N82-10491 Southern Methodist Univ , Dallas, Tex THIN FILM PHOTOVOLTAIC DEVICES Ph.D. Thesis Ching-Long Lin 1981 117 p Avail Univ Microfilms Order No 8117881

The deposition of a silicon film containing a p-n junction on a metallurgical silicon substrate was used for the preparation of thin-film silicon solar cells. The substrate was prepared by the unidirectional solidification of the purified metallurgical silicon on a graphite plate, and the silicon film was deposited by the thermal reduction of trichlorosilane with hydrogen containing appropriate dopants. Indium phosphide films were deposited on foreign substrates by the reaction of indium, hydrogen chloride, and phosphine Their structural and electrical properties were studied Schottky barriers prepared from indium phosphide films were found to have low rectification ratios, high dark currents, and poor photovoltaic response due to grain boundary effects The effects of grain boundaries were partially reduced by thermal oxidation, ruthenium (III) treatment, and nitridation, thus improving the photovoltaic characteristics of thin-film indium phosphide solar Dissert Abstr

N82-10496*# National Aeronautics and Space Administration Pasadena Office, Calif

SOLAR ENERGY MODULATOR Patent Application

Allan R McDougal (JPL, California Inst. of Tech., Pasadena) and Robert R Hale, inventors (to NASA) (JPL, California Inst of Tech, Pasadena) Filed 17 Jul 1981 14 p (Contract NAS7-100)

(NASA-Case-NPO-15388-1, US-Patent-Appl-SN-284286) Avail NTIS HC A02/MF A01 CSCL 10A

A module is described with a receiver having a solar energy acceptance opening and supported by a mounting ring along the optic axis of a parabolic mirror in coaxial alignment for receiving solar energy from the mirror, and a solar flux modulator plate for varying the quantity of solar energy flux received by the acceptance opening of the module. The modulator plate is characterized by an annular, plate-like body, the internal diameter of which is equal to or slightly greater than the diameter of the solar energy acceptance opening of the receiver. Slave cylinders are connected to the modulator plate for supporting the plate for axial displacement along the axis of the mirror thereby shading the opening with respect to solar energy flux reflected from the surface of the mirror to the solar energy acceptance opening

N82-10500*# Optical Coating Lab , Inc , City of Industry, Calif Photoelectronics Div

SILICON SOLAR CELL PROCESS DEVELOPMENT, FABRI-CATION AND ANALYSIS Annual Report, 1 Jul. 1980 -30 Jun. 1981

H I Yoo, P A Iles, and D C Leung 31 Jun 1981 100 p refs Sponsored in part by DOE

(Contract JPL-955089)

(NASA-CR-163787, DOE/JPL-955089-81/12, JPL-9950-597) Avail NTIS HC A05/MF A01 CSCL 10A

Solar cells were fabricated from EFG ribbons dendritic webs, cast ingots by heat exchanger method, and cast ingots by ubiquitous crystallization process Baseline and other process variations were applied to fabricate solar cells. EFG ribbons grown in a carbon-containing gas atmosphere showed significant improvement in silicon quality. Baseline solar cells from dendritic webs of various runs indicated that the quality of the webs under investigation was not as good as the conventional CZ silicon showing an average minority carrier diffusion length of about 60 um versus 120 um of CZ wafers. Detail evaluation of large cast ingots by HEM showed ingot reproducibility problems from run to run and uniformity problems of sheet quality within an ingot Initial evaluation of the wafers prepared from the cast polycrystalline ingots by UCP suggested that the quality of the wafers from this process is considerably lower than the conventional CZ wafers Overall performance was relatively uniform except for a few cells which showed shunting problems caused by inclusions

N82-10501*# Wyle Labs , Inc , Huntsville, Ala AN ANALYTICAL COMPARISON OF THE EFFICIENCY OF SOLAR THERMAL COLLECTOR ARRAYS WITH AND

WITHOUT EXTERNAL MANIFOLDS Final Report

Sep 1981 30 p

(Contract DEN8-00006)

Avail NTIS HC A03/MF A01 (NASA-CR-161852)

An analytical comparison of the efficiency of solar thermal collector arrays with and without external manifolds is reported A FORTRAN computer program was written for the computation of the thermal performance of solar thermal collector arrays with and without external manifolds. Arrays constructed from two example solar thermal collectors are computated. Typical external manifold sizes and thermal insulations are presented graphically and are compared with the thermal performance of the collector

N82-10502* # Wyle Labs, Inc., Huntsville, Ala PERFORMANCE EVALUATION OF THE SOLAR KINETICS T-700 LINE CONCENTRATING SOLAR COLLECTOR Final Report

Sep 1981 49 p (Contract DEN8-000006)

(NASA-CR-161856) Avail. NTIS HC A03/MF A01 CSCL 10A

A performance evaluation of the solar kinetics T-700 line concentrating solar collector is reported. Collector descriptions, summary, test conditions, test equipment, test requirements and procedures, and an analysis of the various tests performed are

N82-10504*# Wyle Labs, Inc., Huntsville, Ala. EVALUATION OF ALL-DAY-EFFICIENCY FOR SELECTED FLAT PLATE AND EVACUATED TUBE COLLECTORS Final Contractor Report

Sep 1981 158 p

(Contract DEN8-000006)

(NASA-CR-161866) Avail. NTIS HC A08/MF A01 CSCL 10A

An evaluation of all day efficiency for selected flat plate and evacuated tube collectors is presented Computations are based on a modified version of the NBSIR 78-1305A procedure for all day efficiency The ASHMET and NOAA data bases for solar insolation are discussed. Details of the algorithm used to convert total (global) horizontal radiation to the collector tilt plane of the selected sites are given along with tables and graphs which show the results of the tests performed during this JMS

N82-10507# Harvard Univ , Cambridge, Mass OPTIMIZATION OF TRANSPARENT ELECTRODE FOR SOLAR CELLS Technical Progress Report, 15 Dec. 1980 -15 Jun. 1981

Roy G Gordon 1981 5 p Prepared for Midwest Research Inst , Golden, Colo

NTIS

(Contract DE-AC02-77CH-00178)

(DE81-023359, SERI/PR-9318-1-T2)

HC A02/MF A01

Fluorine-doped tin oxide films prepared from highly purified tetramethyl tin (TMT) were compared with films prepared under identical conditions using less pure TMT. No effects due to impurities were found. The use of thermocouples to measure the temperature of glass surfaces is unsatisfactory. The use of an infrared emission thermometer is recommended

N82-10509# Boeing Co., Seattle, Wash

SOLAR PROJECT DESCRIPTION FOR PUBLIC SERVICE COMPANY OF NEW MEXICO (LOT 7) SINGLE FAMILY RESIDENCE, RIO RANCHO, NEW MEXICO

6 Aug 1981 58 p (Contracts DE-AB01-76CS-31020, HUD-H-2372)

(DE81-027853. SOLAR/1084-81/50) NTIS

HC A04/MF A01

A solar space heating/domestic hot water system employing 150 square feet air flat plate collectors and 20,000 pounds of rock for storage is described. The collector, storage, energy to load, and auxiliary heat subsystems and five modes of operation are described. Auxiliary space heating is provided by an electric strip heater in the air ducts. The hot water system consists of an 80 gallon solar preheating tank which supplies a 40 gallon conventional tank An electric heating element provides auxiliary heating in the preheat tank

02 SOLAR ENERGY

N82-10510# Boeing Co., Seattle, Wash SOLAR PROJECT DESCRIPTION FOR COLORADO SUN-WORKS: SINGLE FAMILY

1981 74 p

(Contracts DE-AB01-76CS-31020, HUD-H-2372)

(DE81-028054. SOLAR/1051-81/50)

HC A04/MF A01

NTIS

A passive solar energy system for both space heating and domestic hot water preheating is described. The passive space heating system consists of a drum wall and direct gain system Heat losses are reduced by a Beadwall movable insulation. The vertically stacked drums near the south wall form a drumwell chimney where heated air rises through ceiling vents above the drums into an open plenum area between the roof and the ceiling of the rooms. Additional vents from this plenum on the north side of the house provide a path for the warm air into the room. Earth berms on the north, east, and west sides of the house, a one foot covering of earth on the roof, and an entry vestibule are used. Cooling is enhanced by night ventilation. The hot water system consists of two 30 gallon tanks painted black and positioned next to the south wall. Original cost estimates for provisioning and installation of the solar system are given

N82-10511# Department of Housing and Urban Development, Washington, D C

SOLAR PROJECT DESCRIPTION FOR LIVING SYSTEMS SINGLE FAMILY RESIDENCE, DAVIS, CALIFORNIA

Oak Ridge, Tenn DOE 31 Aug 1981 75 p Prepared in cooperation with Boeing Co., Seattle

(Contract DE-AB01-76CS-31020)

(DE81-029743. SOLAR/1046-81/50)

Avail

HC A04/MF A01

HC A11/MF A01

Two independent systems are described - a direct gain passive solar space heating system and an active domestic hot water preheating system Large south-facing windows and a clerestory skylight permit direct winter Sun to enter the house. Solar energy thermal storage is provided by both water filled tubes and the concrete slab floor Movable shutters and insulating curtains provide capability to reduce night heat losses. Summer overheat protection is provided by roof overhangs and by natural ventilation. The collector, storage, heating load, and auxiliary loads subsystems and modes of operation are described for both systems. The house is instrumented for thermal performance evaluation. Original cost estimates for provisioning and installation of the solar system are given

N82-10512# Midwest Research Inst , Kansas City, Mo Solar **Energy Research Inst**

ENERGY END-USE REQUIREMENTS IN MANUFACTURING,

Dilip R Limaye (Synergic Resources Corp.), Steven Isser (Synergic Resources Corp.), Roy Beatty (Synergic Resources Corp.), Glenn Colville (Synergic Resources Corp.), Karen Lang (Synergic Resources Corp.), and Frank Krawiec Jul 1981 233 p refs (Contracts DE-AC02-77CH-00178, EG-77-C-01-4042) (DE81-028975, SERI/TR-733-790R-Vol-1) Avail NTIS

A review and evaluation of existing industrial energy data bases were undertaken to assess their potential for supporting SERI research to analyze technical and economic feasibility of solar technologies, and to establish multilayer R and D programs for solar thermal industrial electric power systems and solar IPH systems In the review of existing industrial energy data bases, the level of detail, disaggregation, and primary sources of information were examined. The focus was on fuels and electric energy used for heat and power purchased by the manufacturing subsector and listed by 2-, 3-, and 4-digit SIC, primary fuel, and end use

N82-10513# Sandia Labs , Albuquerque, N Mex FREQUENCY RESPONSE ANALYSIS OF FLUID CONTROL SYSTEMS FOR PARABOLIC-TROUGH SOLAR COLLEC-TORS

R Schindwolf Jul 1981 29 p refs (Contract DE-AC04-76DP-00789) (DE81-029293. SAND-80-0385) HC A03/MF A01

NTIS

A linearized steady-state frequency response is derived for parabolic-trough collectors and for connecting piping that can be used in standard gain-phase analyses to evaluate system stability and closed-loop frequency response. The frequency-

response characteristics of a typical collector string and piping are used in a gain-phase analysis to get some insight into the effect on system stability of various system parameters such as controller gain, sensor and controller-time constants, and sensor

N82-10515# Science Applications, Inc., McLean, Va Optics Technology Div

TECHNICAL AND ECONOMIC ASSESSMENT OF SOLAR THERMOPHOTOVOLTAIC CONVERSION Final Report, Jul.

W Koechner, H R Verdun, and N C Wyeth Jul 1981 190 p refs Sponsored by Electric Power Research Inst (EPRI Proj 1415-1)

HC A09/MF A01

(DE81-803762. EPRI-AP-1940) NTIS

The solar thermophotovoltaic (STPV) conversion concept is aimed at large-scale electric utility applications. After consideration of several options, a conceptual system arrangement was chosen an analyzed to provide calculations for STPV system configuration, size, performance, and cost Baseline designs were selected fo the optical and converter subsystems, and a detailed analysis of the performance of these subsystems was made using mathematical models an computer codes. The various subsystems operating parameters were related to overall sytem performance and cost, and a minimum cost/power output point was found for the conceptual system

N82-10516# Veda, Inc., Camarillo, Calif. ECONOMIC ANALYSIS OF THE UNIFIED HELIOSTAT ARRAY

7 Nov 1980 395 p refs (Contract DE-AC03-80SF-10802) (DE81-026698, DOE/SF-10802/T4,

VEDA-43905-80U/P0069) Avail NTIS HC A17/MF A01

The array (UHA) is comprised of conventional two-axis heliostats mounted on a terraced south-facing wall of a single structure. The arrangement of heliostats on the array is chosen to eliminate or control the degree of inter-heliostat shading and blocking. The UHA was investigated as to cost and optical performance Two heliostats, the Veda Industrial Heliostat (VIH) and the Repowering Helistat were investigated in conjunction with the UHA. The UHA is found to be a viable candidate for solar thermal central receiver applications. The UHA-VIH combination was shown to provide very high flux densities and to be suitable for high temperature applications in the 1000 K to 2000 K range. These temperatures were shown to be achieve even with very small (1 MWt) collector fields.

N82-10519# Lincoln Lab , Mass Inst of Tech , Lexington PERFORMANCE OF TERRESTRIAL PHOTOVOLTAIC MODULES AT MIT LINCOLN LABORATORY EXPERIMEN-TAL PHOTOVOLTAIC SYSTEMS

S E Forman 30 Apr 1981 19 p refs (Contract DE-AC02-76ET-20279) DOE/ET-20279/140) (DE81-029995. HC A02/MF A01

Through a program of periodic surveillance, measurements and inspections, over 250 electrically failed modules were located. removed and analyzed during a four-year period. The principal causes of failure were cells cracked due to weathering or internal module stresses, failed solder joints; interconnects not soldered to rear sides of cells at assembly, cells or interconnects electrically shorted to metallic substrates, and broken or split interconnects Details and photographs of many of the different typs of failures are presented. In addition, some of the analysis techniques used to locate the failures are described

N82-10521# Chicago Univ , III Enrico Fermi Inst INTEGRATED FUNCTION NONIMAGING CONCENTRATING COLLECTOR TUBES FOR SOLAR THERMAL ENERGY **Technical Progress Report**

Roland Winston and Joseph J OGallagher 25 Aug 1981 21 p refs

(Contract DE-AC02-80ER-10558)

(DE81-029677, DOE/ER-10558/2)

NTIS

NTIS

Avail

HC A02/MF A01

A substantial improvement in optical efficiency over contemporary external reflector evacuated tube collectors was achieved by integrating the reflector surface into the outer glass envelope The design, fabrication and preliminary test results are described

for a prototype collector based on this concept. Efficiencies above 40% up to nearly 300 C may be achieved

N82-10534# Midwest Research Inst., Golden, Colo Solar Energy Research Inst

STANDARDS APPLICATION AND DEVELOPMENT PLAN FOR SOLAR THERMAL TECHNOLOGIES

H R W Cobb Jul 1981 218 p refs (Contracts DE-ACO2-77CH-00178, EG-77-C-01-4042) (DE81-030310. SERI/TR-742-885)

HC A10/MF A01

NTIS

Functional and standards matrices, developed from input from ST users and from the industry that will be continually reviewed and updated as commercial aspects develop are presented. The matrices highlight codes, standards, test methods, functions and definitions that need to be developed. They will be submitted through ANSI for development by national consensus bodies. A contingency action is proposed for standards development if specific input is lacking at the committee level or if early development of a standard would hasten commercialization or gain needed jurisdictional acceptance

N82-10537# Los Alamos Scientific Lab , N Mex STATE OF THE ART IN PASSIVE SOLAR HEATING

J Douglas Balcomb 1981 4 p Presented at the Passive and Hybrid Solar Energy Program Update Meeting, Washington, D C. 9-12 Aug 1981 (Contract W-7405-eng-36)

(LA-UR-81-2185. CONF-810832-1) Avail NTIS

HC A02/MF A01

The state of the art is outlined according to four major categories passive, solar practice, evaluation, design, and products and materials. Needed future research activities and point industry/government activities are listed DOF

N82-10538# Los Alamos Scientific Lab , N Mex LOS ALAMOS NATIONAL LABORATORY PASSIVE SOLAR **PROGRAM**

Donald A Neeper 1981 12 p refs Presented at the Passive and Hybrid Solar Energy Program Update Meeting, Washington, D C , 9-12 Aug 1981 (Contract W-7405-eng-36)

(DE81-028778, LA-UR-81-2162, CONF-810832-2) NTIS HC A02/MF A01

Progress in passive solar tasks performed for FY-81 is documented Twenty-eight configurations of sunspaces were studied using the solar load ratio method of predicting performance, the configuration showing best performance is discussed The minimum level of insulation needed to generate convective flow in the thermosphon test rig is noted and measured Information is also included on test room performance, off speak auxiliary electric heating for a passive home, free convection experiment, monitored building, and technical support to the US Department of Energy DOE

N82-10539# Midwest Research Inst., Kansas City, Mo Solar Energy Research Inst

INVESTIGATION OF PHOTOVOLTAIC MECHANISMS IN POLYCRYSTALLINE THIN-FILM SOLAR CELLS Quarterly

Report, 1 Aug. - 31 Oct. 1980 T A Temofonte 3 Apr 1981 18 p refs (Contract DE-ACO2-77CH-00178)

(DE81-027272, SERI/PR-9233-1-T1, QR-1) Avail NTIS HC A02/MF A01

Initial efforts focused on exploring the role of atomic hydrogen on silicon surfaces. The atomic hydrogen was generated using an inductively coupled plasma. Comparisons using Auger sputter profiling were made of hydrogenated silicon surfaces, deliberately oxidized silicon surfaces and silicon surfaces having a native oxide The auger spectrum of a hydrogenated silicon surface is initially qualitatively similar to that for an oxidized surface. Distinct differences emerge as a function of sputtering depth, ziv, the ratio of free silicon to bonded silicon decreases first before finally decreasing. This implies a significantly different surface composition for hydrogenated silicon compared to oxidized silicon DOE

N82-10541# Sandia Labs , Albuquerque, N Mex SOLAR ENERGY SYSTEM DESIGN: A SIMPLE METHOD FOR SIZING THE COLLECTOR FIELD AND THERMAL STORAGE

Ralph R Peters Jul 1981, 81 p refs (Contract DE-AC04-76DP-00789) SAND-81-1541) (DE81-028852, HC A05/MF A01

NTIS

The Zero Marginal Cost (ZMC) technique to enable quick. accurate designs of parabolic trough solar energy systems was developed. The ZMC technique is discussed and it is shown that systems designed with this technique compare quite favorably with those designed using expensive computer codes

N82-10542# SRI International Corp., Menlo Park, Calif CONCEPTUAL DESIGN OF A GLASS-REINFORCED CONCRETE SOLAR COLLECTOR

Arthur J. Siemmons, Dale W. Ploeger, and Ron Lundgren (Sandia Labs , Albuquerque, N Mex) Jul 1981 51 p refs

(Contract DE-AC04-76DP-00789)

(DE81-029280, SAND-81-7011) NTIS HC A04/MF A01

An investigation of the properties and characteristics of glassfiber-reinforced concrete (GRC) was made to determine its suitability as a reflector substrate and structure for heliostats and solar collectors. The material properties and characteristics of GRC were established by tests on small flat panels. A conceptual design of a 2-m x 6-m parabolic trough solar collector module and a preliminary production-cost analysis were also completed

N82-10543# Boeing Computer Services, Inc., Seattle, Wash INTERMEDIATE PHOTOVOLTAIC-SYSTEM APPLICATION EXPERIMENT OPERATIONAL PERFORMANCE REPORT. VOLUME 1: FOR LOVINGTON SQUARE SHOPPING CENTER SITE, LOVINGTON, NEW MEXICO

Jul 1981 18 p Prepared for Sandia Labs. Albuquerque. N Mex

(Contract DE-ACO4-76DP-00789)

(DE81-028971. SAND-81-7085/1) NTIS Avail HC A02/MF A01

A 100 kwp photovoltaic flat panel system is planned for application in a shopping center to assess problems associated with utility tie-in and to provide utility experience with a photovoltaic system. The project is briefly outlined, and the participants are listed Relevant weather data and reference operating conditions are given and four operational modes are described System specifications are given and the solar array, control, protection, and data acquisition and instrumentation DOE subsystems are described

N82-10547# Mid-American Solar Energy Complex, Minneapolis,

SUMMARY OF PASSIVE-SOLAR-RETROFIT WORKSHOPS Jun 1981 12 n

Avail

NTIS

(Contract DE-AC02-79CS-30150)

MASEC-CF-81-028) (DE81-028146.

HC A02/MF A01

Efforts are described to provide training in the latest passive solar retrofit techniques to a wide sector of residential design and construction professionals. Three 20-hour passive solar single-family retrofit workshops were attended by 116 residential construction-related participants. Each of the three workshops is described. The workshop topics and workbook were evaluated by 65 participants, and suggestions were made for improve-

N82-10558# Lincoln Lab , Mass Inst of Tech , Lexington

TESTING AND EVALUATION OF A SOLAR PHOTOVOLTAIC FLYWHEEL ENERGY STORAGE SYSTEM

Philip O Jarvinen, Bronwyn L Prench, R Duncan Hay, and Neil F Rasmussen (American Power Conversion, Burlington, Mass.) 1981 6 p Presented at the IECEC Conf. Atlanta, 9-14 Aug 1981

(Contract DE-AC02-76ET-20279)

CONF-810812-4) (DOE/ET-20279/130. Avail NTIS HC A02/MF A01

Measurements made on a 1/10 scale, magnetically levitated, residential solar photovoltaic (PV) flywheel energy storage system which acts as a complete interface between a solar PV array and an ac load are reported. The overall in/out electrical storage efficiency of the flywheel unit was measured along with the power transfer efficiencies of individual components and the system spin down tar losses. An overall storage efficiency of 82 percent was measured for the flywheel storage system when operated in a utility interactive mode

N82-10563# Midwest Research Inst., Golden, Colo Energy Research Inst

APPLICATION OF THERMAL ENERGY SOLAR **BUILDINGS AND INDUSTRY**

Charles F Kutscher May 1981 32 p refs Presented at the Energy and the Man-Built Environment Conf., Vail, Colo., 3-5 Aug 1981, sponsored by Am Soc of Civil Eng (Contract DE-AC02-77CH-00178)

CONF-810808-6) NTIS (SERI/TP-641-1222. Avail HC A03/MF A01

Flat plate collectors and evacuated tube collectors are described, as are parabolic troughs, Fesnel lenses, and compound parabolic concentrators. Use of solar energy for domestic hot water and for space heating and cooling are discussed. Some useful references and methods of system design and sizing are given This includes mention of the importance of economic analysis. The suitability of solar energy for industrial use is discussed, and solar ponds, point-focus receivers and central receivers are briefly described. The use of solar energy for process hot water, drying and dehydration, and process steam was examined, industrial process heat field tests by the Department of Energy are discussed, and a solar total energy system in Shenandoah, GA is briefly described.

N82-10568# Institute of Gas Technology, Chicago, III ELECTROCHEMICAL PHOTOVOLTAIC CELLS Quarterly Technical Progress Report, 1 Nov. 1980 - 31 Jan. 1981 Peter G P Ang, Anthony J Tiller, Anthony A Rossignuolo, and Anthony F Sammells Apr 1981 24 p ref Sponsored in cooperation with Midwest Research Inst.

(Contract EG-77-C-01-4042) (DE81-769704. SERI/PR-9175-1-T3) NTIS Avail HC A02/MF A01

The photoelectrochemical properties of p-Si, p-InP, p-MoS2, and n-CdSe semiconductors are presented. A number of redox storage systems are discussed Characteristics of single crystal systems and of surface treatments are investigated. Long term testing was performed with polycrystalline CdSe and with p-InP single crystal in electrochemical cells. The quality and long term stability of various electrodes, electrolytes, and separator materials are studied

N82-10569# Pennsylvania State Univ, University Park Materials Research Lab

CONTROLLED CADMIUM TELLURIDE THIN FILMS FOR SOLAR-CELL APPLICATIONS Quarterly Report, 1 Dec. 1980 - 1 Feb. 1981

M B Das and S W Krishnaswamy 15 May 1981 refs

(Contract DE-AC02-77CH-00178)

(DE81-023275, SERI/PR-9131-1-T3, QR-3) Avail NTIS HC A02/MF A01

Indium doped CdTe films cadmium vacancies occur which cause the presence of deep level acceptor states in the material are discussed. By sputtering at a cadmium overpressure it was possible to compensate for these vacancies and improve the device quality. Extensive temperature dependent measurements of dark and illuminated I/V characteristics of gold metalized Schottky barrier diodes based on these improved and reproducible films were made Characteristics showing I/sub sc/ and V/sub oc/ at different temperatures and different illumination level are presented

N82-10570# Sandia Labs , Albuquerque, N Mex Photovoltaic Protects Div

SOLAR PHOTOVOLTAIC SYSTEM ENGINEERING PERSPEC-TIVES

Gary J Jones 1981 7 p refs Presented at the Energy in Man-Built Environ The Next Decade Spec Conf., Vail., Colo., 3 Aug 1981

(Contract DE-AC04-76DP-00789)

(DE81-023179, SAND-81-1164C, CONF-810808-7) Avail NTIS HC A02/MF A01

The activities of the national photovoltaic program which aid the photovoltaic system background information are presented and major issues are highlighted DOE

N82-10571# Messerschmitt-Boelkow-Blohm G m b H, Ottobrunn (West Germany) Space Div

TECHNOLOGICAL ACTIVITIES FOR HIGH PERFORMANCE RECEIVERS Final Report

Guenther Schmidt, Erich Kirner, and Helmut Zewen Bonn Bundesministerium fuer Forschung und Technologie Dec 1980 86 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-80-133, MBB-UR-39979-79, ISSN-0340-7608) Avail NTIS HC A05/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 18,05

Preliminary studies were carried out on the optimization of the energy transfer efficiency from the incident solar radiation into the heat transfer medium of solar thermal plants by designing high performance receivers. The transfer efficiency has a direct impact on the overall plant efficiency and the size of the cost effective collector field Two main lines were followed, closed Rankine cycles with organic heat transfer media at temperatures between 350 and 400 C, and gas turbine cycles at temperatures from 800 to 900 C A test receiver cooled by organic media was built and its thermal and mechanical resistance as well as the behavior of different heat transfer media with respect to thermal efficiency and stability were analyzed. Industrial application appears feasible

N82-10577# Department of Agriculture, Washington, D C THE YOUNG SOLAR COLLECTOR: AN EVALUATION OF ITS MULTIPLE FARM USES

Walter G Heid, Jr May 1981 21 p ref (PB81-214132, AER-466) Avail NTIS HC A02/MF A01 CSCL 13A

The features of the Young collector and reports on its physical and economic performance were studied. The collector is portable and tiltable, with a flexible airflow system it is found that it satisfactorily dries grain, provides home heating, and saves energy The homemade, low cost Young flat plate solar collector for multiple uses on the farm was designed by a farm couple and the small farm energy project

N82-10863# Sandia Labs , Albuquerque, N Mex Photometrics and Optical Development Div

AUTOMATED FRESNEL LENS TESTER SYSTEM

Gary S Phipps Jul 1981 71 p (Contract DE-ACO4-76DP-00789)

(DE81-029483. SAND-81-1187) NTIS Avail

HC A04/MF A01

An automated data collection system controlled by a desktop computer for testing Fresnel concentrators (lenses) intended for solar energy applications was developed. The system maps the two dimensional irradiance pattern formed in a plane parallel to the lens, whereas the lens and detector assembly track the Sun A point detector silicon diode measures the irradiance at each point of an operator defined rectilinear grid of data positions Comparison with a second detector measuring solar insolation levels results in solar concentration ratios over the image plane. Summation of image plane energies allows calculation of lens efficiencies for various solar cell sizes

N82-10952# Argonne National Lab , III SOLAR DATA BASE MANAGEMENT SYSTEM

I Singh (Mohawk Coll , Hamilton, Ont), R M Wolosewicz, H Singh, and P S Chopra 1980 8 p refs Presented at the ASME Century 2 Emerging Technol Conf., San Francisco. 12-15 Aug 1980

(Contract W-31-109-eng-38)

(DE81-023122. CONF-800804-40)

NTIS Avail

HC A02/MF A01

The data base management system established to handle the reliability and materials assessment data generated by over 100 solar heating and cooling systems was assessed. The planning. the design, and some of the software used to handle data processing and reduction requirements are described

N82-11209*# Jet Propulsion Lab , California Inst of Tech .

FRACTURE MECHANICS OF CELLULAR GLASS

J G Zwissler and M A Adams 1 Feb 1981 53 p refs (Contracts NAS7-100, DE-AI01-81ET-20307) (NASA-CR-164959, JPL-Pub-81-16) NTIS Avail HC A04/MF A01 CSCL 11A

The fracture mechanics of cellular glasses (for the structural substrate of mirrored glass for solr concentrator reflecting panels) are discussed Commercial and developmental cellular glasses were tested and analyzed using standard testing techniques and

models developed from linear fracture mechanics. Two models describing the fracture behavior of these materials were developed Slow crack growth behavior in cellular glass was found to be more complex than that encountered in dense glasses or ceramics. The crack velocity was found to be strongly dependent upon water vapor transport to the tip of the moving crack. The existence of a static fatigue limit was not conclusively established. however, it is speculated that slow crack growth behavior in Region 1 may be slower, by orders of magnitude, than that found in dense glasses

N82-11247# California Univ. Livermore Lawrence Livermore Lab

SOLAR COAL-GASIFICATION REACTOR FOR HYDROCAR-**BON-FREE SYNTHESIS GAS**

W R Aiman Jun 1981 10 p Presented at the STTF Users Assoc Ann Meeting, Pasadena, Calif., 23 Apr. 1981

(Contract W-7405-eng-48)

(DE81-026600, UCRL-86260, CONF-810469-3) Avail NTIS HC A02/MF A01

The products from a coal gasification process are discussed In synthesis gas production, the end product is a high Btu gas composed of methane and higher hydrocarbons. Furthermore, the liquid hydrocarbons can be even more valuable as feedstocks for other processes. In other applications such as methanol production, the hydrocarbon content of the synthesis gas is a non-reactive diluent that must be bled away from the product synthesis area to keep its concentration from building up. In addition to the above benefits, this reactor requires substantially less steam in the coal gasification process. The reactor is able to produce hydrocarbon-free synthesis gas because it withdraws the pyrolysis gases from the reactor as they are formed and reinjects them above the char gasification zone where they are steam reformed into CO, CO2, and H2 Since almost all of the hydrocarbons released in coal gasification come off with the pyrolysis gases, the reactor will produce nearly hydrocarbon-free gas

N82-11316# Mid-American Solar Energy Complex, Bloomington,

Minn MASEC SOLAR 80 HOME DESIGNS

1980 19 p (DE81-028344) NTIS MASEC-PA-80-007) Avail HC A02/MF A01

Plans of passive solar homes designed by ten teams from various sections of the mid-American region are presented. The energy efficient designs use up to 80% less fossil fuel energy for heating than those built to conventional construction standards Energy conserving and passive design techniques are discussed The design features of the ten (RidgeWay, ClaireMont, Solar-Way, KirkWood, SunSource, ParkLand, CedarWood, SunRise, SunCrest, and WaterFord) homes are presented

N82-11325# Booz-Allen and Hamilton, Inc., Bethesda, Md Energy and Environment Div

USER NEEDS FOR SOLAR DECISION-MAKING TOOLS: THE HOMEBUILDING INDUSTRY Final Report

Min Kantrowitz John Kurtz, and Kimball Hart 1981 refs. Prepared in cooperation with Midwest Research Inst., Golden, Colo

(Contracts DE-AC02-77CH-00178, EG-77-C-01-4042)

(DE81-027293 SERI/TR-98252-1b) NTIS HC A07/MF A01

The need for decision tools and design tools to be used by decision makers considering using solar energy in the single-family residential construction sector was studied. Three builder groups were found based upon decision making patterns relative to innovation and a five-step decision process. Eleven existing design tools were reviewed against identified user needs. The principal conclusions are that decision tools are largely lacking and design tools do not easily fit user needs. Recommendations for further study are made

N82-11407# Science Applications, Inc., McLean, Va Solar Technology Div

PARAMETRIC SENSITIVITY STUDY FOR SOLAR-ASSISTED **HEAT-PUMP SYSTEMS Final Report**

N M White and J H Morehouse Jul 1981 Prepared for Midwest Research Inst., Golden, Colo (Contracts DE-AC02-77CH-0017, EG-77-C-01-4042)

NTIS SERI/TR-98288-1) (DE81-030309. Avail HC A06/MF A01

The engineering and economic parameters affecting life-cycle costs for solar-assisted heat pump systems are investigted. The change in energy usage resulting from each engineering parameter varied was developed from computer simulations, and is compared with results from a stand-alone heat pump system. Three geographical locations are considered Washington, D.C. Fort Worth, TX, and Madison, WI Results indicate that most engineering changes to the systems studied do not provide significant energy savings. The most promising parameters to ary are the solar collector parameters tau (-) and U/sub L/ the heat pump capacity at design point, and the minimum utilizable evaporator temperature. Costs associated with each change are estimated, and life-cycle costs computed for both engineering parameters and economic variations in interest rate, discount rate, tax credits, fuel unit costs and fuel inflation rates. Results indicate that none of the feasibile engineering changes for the system configuration studied will make these systems economically competitive with the stand-alone heat pump without a considerable tax credit

N82-11413# Brookhaven National Lab , Upton, N Y Dept of Energy and Environment

DOE SOLAR-ASSISTED HEAT-PUMP PROGRAM: **EVOLUTION AND ITS POTENTIAL**

J W Andrews 1981 5 p refs Presented at the Active Solar Contractors' Rev Meeting, Washington, D.C. Sep. 1981 (Contract DE-AC02-76CH-00016)

(DE81-026055, BNL-29677, CONF-810912-10) Avail NTIS HC A02/MF A01

Progress in the solar assisted heat pump program is described in terms of the progressive modification of original assumptions on the basis of accumulating experience. The ways in which these modifications led to enhanced system potential are explained A major impetus for progress is the assimilation and reconciliation of divergent systems analysis results. Technical accomplishments in the program are described, and needed future activities are listed

N82-11544*# Teledyne Brown Engineering, Huntsville, Ala Engineering Services Div
INVESTIGATION OF DIRECT SOLAR-TO-MICROWAVE

ENERGY CONVERSION TECHNIQUES Final Report

N E Chatterton, T K Mookherji, and P K Wunsch Jan 1978 107 p refs

(Contract NAS8-32643)

(NASA-CR-161883. ESD-78-MSFC-2174) NTIS HC A06/MF A01 CSCL 10A

Identification of alternative methods of producing microwave energy from solar radiation for purposes of directing power to the Earth from space is investigated. Specifically, methods of conversion of optical radiation into microwave radiation by the most direct means are investigated. Approaches based on demonstrated device functioning and basic phenomenologies are developed. There is no system concept developed, that is competitive with current baseline concepts. The most direct methods of conversion appear to require an initial step of production of coherent laser radiation. Other methods generally require production of electron streams for use in solid-state or cavity-oscillator systems Further development is suggested to be worthwhile for suggested devices and on concepts utilizing a free-electron stream for the intraspace station power transport mechanism

N82-11548*# Jet Propulsion Lab., California Inst. of Tech., Pasadena

THE EFFECTS OF IMPURITIES ON THE PERFORMANCE OF SILICON SOLAR CELLS

K A Yamakawa 1 Sep 1981 75 p refs (Contracts NAS7-100, EX-76-A-29-1012,

DE-AI01-76ET-20356)

(NASA-CR-164945, JPL-Pub-81-76, DOE/JPL-1012-57) Avail NTIS HC A04/MF A01 CSCL 10A

The major factors that determine the tolerable concentrations of impurities in silicon feedstock for solar cells used in power generation are discussed in this report it is concluded that a solar-grade silicon can be defined only for a specific manufacturing process it is also concluded that it is the electrical effects, efficiency and resistivity, that are dominant in determining tolerable

concentrations of impurities in the silicon feedstock. Crystal growth effects may become important when faster growth rates and larger crystal diameters are developed and used. Author

N82-11549*# Jet Propulsion Lab., California Inst. of Tech., Pasadena

IRRIGATION MARKET FOR SOLAR THERMAL PARABOLIC DISH SYSTEMS

Hamid Habib-agahi and Sue Campbell Jones 1 Sep 1981 40 p refs

(Contracts NAS7-100, DE-AT04-81AL-16228)

(NASA-CR-164955, JPL-Pub-81-85, DOE/JPL-1060-49) Avail NTIS HC A03/MF A01 CSCL 10A

The potential size of the onfarm-pumped irrigation market for solar thermal parabolic dish systems in seven high-insolation states is estimated. The study is restricted to the displacement of three specific fuels gasoline, diesel and natural gas. The model was developed to estimate the optimal number of parabolic dish modules per farm based on the minimum cost mix of conventional and solar thermal energy required to meet irrigation needs. The study concludes that the potential market size for onfarm-pumped irrigation applications ranges from 101.000 modules when a 14 percent real discount rate is assumed to 220.000 modules when the real discount rate drops to 8 percent Arizona, Kansas, Nebrasks, New Mexico and Texas account for 98 percent of the total demand for this application, with the natural gas replacement market accounting for the largest segment (71 percent) of the total market.

 ${\bf N82\text{-}11550^*\#}$ Jet Propulsion Lab , California Inst of Tech , Pasadena

SECONDARY AND COMPOUND CONCENTRATORS FOR PARABOLIC DISH SOLAR THERMAL POWER SYSTEMS L D Jaffe and P T Poon 15 Apr 1981 47 p refs Sponsored in part by DOE (Contract NAS7-100)

(NASA-CR-164960, JPL-Pub-81-27, DOE/JPL-1060-43) Avail NTIS HC A03/MF A01 CSCL 10A

A secondary optical element may be added to a parabolic dish solar concentrator to increase the geometric concentration ratio attainable at a given intercept factor. This secondary may be a Fresnel lens or a mirror, such as a compound elliptic concentrator or a hyperbolic trumpet. At a fixed intecept factor, higher overall geometric concentration may be obtainable with a long focal length primary and a suitable secondary matched to it. Use of a secondary to increase the geometric concentration ratio is more likely to e worthwhile if the receiver temperature is high and if errors in the primary are large. Folding the optical path with a secondary may reduce cost by locating the receiver and power conversion equipment closer to the ground and by eliminating the heavy structure needed to support this equipment at the primary focus. Promising folded-path configurations inclue the Ritchey-Chretien and perhaps some three element geometries Folding the optical path may be most useful in systems that provide process heat

N82-11551*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio SOLAR CELL DEVELOPMENT FOR THE POWER EXTENSION

PACKAGE

Cosmo R Baraona and James L Cioni (NASA, Johnson Space Center) 1981 8 p refs Presented at the 16th Intersoc Energy Conversion Conf., Atlanta, 9-14 Aug 1981

(NASA-TM-82685, E-922) Avail NTIS HC A02/MF A01 CSCL 10A

The PEP is a 32 kilowatt flexible substrate, retrievable, solar array system for use on the Space Shuttle Solar cell costs will be reduced by increasing cell area and simplifying cell and coverglass fabrication processes and specifications. The cost goal is to produce cells below \$30 per watt. Two and ten ohm-cm silicon cells were investigated. In phase I of the cell development program a few thousand candidate cells will be produced and evaluated for utility and quality. In phase II a large number of cells will be fabricated to verify production readiness and cell yields and costs. This schedule is compatible with PEP initial operational capability in 1984 Approximately 140,000 large area (5.9 x 5.9 cm) cells will be required for two PEP solar arrays The status of the cell development and testing, including a radiation damage test and side-by-side comparison of candidate cell types with pre- and post-irradiation airplane calibration of outer space short-circuit current, is reported .

N82-11554# Arkansas Univ , Fayetteville

MISSISSIPPI COUNTY COMMUNITY COLLEGE SOLAR PHOTOVOLTAIC PROJECT Final Report

F K Deaver, M M Johnson, Torn Pugh, Ray Snowden, W D Turner, J D Wall, J G Williams, and J R Yeargan Nov 1980 256 p refs

(Contract DE-FG05-77CS-20347, Grant EG-77-G-05-5565) (DE81-030669, DOE/ET-20347/T1) Avail NTIS HC A12/MF A01

A weather station was maintained from April 1978 to April 1980. Daily totals of direct normal and global insolation are given, and an hour-by-hour printout of direct normal, global, and diffuse solar radiation for the entire two year period is included. A number of studies were conducted, including daylighting, energy conservation and management, design tradeoffs, and landscaping. The collector selection process included the writing of specifications, providing design data, reviewing the various collector designs, inspecting potential vendor facilities, monitoring on-site tests, and the final selection. A simulation was made of the entire system, including both an electrical and thermal simulation of the photovoltaic array and a thermal simulation of the various buildings. Example printouts of the simulations are included.

DOE

N82-11557# RCA Labs, Princeton, N J
AMORPHOUS BORON-SILICON-HYDROGEN ALLOYS FOR
THIN-FILM HETEROJUNCTION SOLAR CELLS Quarterly
Technical Progress Report, 1 Sep. - 30 Nov. 1980

A R Moore, D E Carlson, and R W Smith May 1981 18 p

(Contract DE-AC02-77CH-00178)

(DE81-027234, SERI/PR-0-9010-2, QTPR-2) Avail NTIS HC A02/MF A01

The conductivity of a-B Si H films increases with substrates temperature and annealing temperature for temperatures up to 5000 C (highest investigated). However, increasing the conductivity causes the optical gap to decrease Preliminary results on a-B Si H/a-Si H heterojunction devices are not encouraging as interface states appear to limit the conversion efficiency to approx 15%.

N82-11558# RCA Labs, Princeton, N J
AMORPHOUS BORON-SILICON-HYDROGEN ALLOYS FOR
THIN-FILM HETEROJUNCTION SOLAR CELLS Quarterly
Technical Progress Report, 1 Dec. 1980 - 28 Feb. 1981
A R Moore, D E Carlson, and R W Smith Jun 1981 18 p

refs Prepared for Midwest Research Inst., Golden, Colo (Contract DE-AC02-77CH-00178)

(DE81-027254, SERI/PR-0-9010-3, QTPR-3) Avail NTIS HC A02/MF A01

Amorphous boron-silicon-hydrogn (a-B Si H) alloys were used to make heterojunction contacts to hydrogenated amorphous silicon (a-Si H) films. The performance of a-B Si H/a-Si H heterojunction cells are limited mainly by a large density of interface states. Another p-type, wide bandgap material, microcrystalline silicon-carbon-hydrogen (M-Si C H) was investigated. Three techniques are explored for production of m-Si C H films glow discharge deposition, thermal annealing of a-Si C H films, and laser annealing of a-Si C H films.

N82-11560# Automation Industries, Inc., Silver Spring, Md Vitro Labs Div

SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: FOREST CITY DILLON, WASHINGTON, D.C., JANUARY 1980 - DECEMBER 1980

D W Missal 1980 82 p refs (Contract DE-AC02-79CS-30027)

(DE81-028174. SOLAR/1041-81/14) Avail NTIS HC A05/MF A01

An active solar energy system consisting of single glazed flat plate collectors, 3200 gallons of storage liquid, and an auxiliary oil fired boiler, was designed to supply 59% of the hot water demand for a high rise apartment building. The annual solar fraction predicted by the f chart simulation was 37%, and the solar fraction measured was 32%. Other measures of performance, including solar system coefficient of performance, are given. The performance of the collector, storage, and domestic hot water subsystems is discussed.

N82-11561# Automation Industries, Inc., Silver Spring, Md Vitro Labs. Div

SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: MONTECITO PINES, SANTA ROSA, CALIFORNIA, NOVEM-BER 1979 - APRIL 1980

NTIS

E N Ashman 1980 80 p refs (Contract DE-AC01-79CS-30027) (DE81-028175. SOLAR/1045-80/14) HC A05/MF A01

An active solar energy system consisting of 950 square feet of flat plate collectos, gas fired auxiliary boilers, and 2000 gallons of storage was designed. The solar fractions actually achieved were 11% for heating and 44% for hot water Measures of performance are given, including, solar savings ratio, conventional fuel savings, system performance factor, and solar system coefficient of performance. The performance of the collector, storage, space heating and domestic hot water subsystems are discussed

N82-11564# McDonnell-Douglas Corp . Huntington Beach, Calif SECOND GENERATION HELIOSTAT, VOLUME 1 Report

D A Steinmeyer Apr 1981 428 p Prepared for Sandia Labs , Livermore, Calif 2 Vol (Contract DE-AC04-76DP-00789) (DE81-029618. SAND-81-8177-Vol-1) Avail NTIS HC A19/MF A01

The heliostat subsystem design is described. The test program is summarized, including component testing, subsystem operation and the shipment and installation. The production heliostat description, the manufacturing process definitions, and the manufacturing facility definition are summarized. The installation, operations, and maintenance requirements for the 50 MWe field are reviewed. Future development activities aimed at further cost reduction are discussed

N82-11566# Sandia Labs , Livermore, Calif

ÖF PHOTOVOLTAIC COST ELEMENTS. VOLUME 1: EXECUTIVE REPORT. VOLUME 2: PROJECT **BACKGROUND** Final Report

James B Ayers Jul 1981 269 p Prepared in cooperation with Barry (Theodore) and Associates, Los Angeles 5 Vol. (Contract DE-AC04-76DP-00789)

(DE81-030982, SAND-81-7014-Vol-1, SAND-81-7014-Vol-2) Avail NTIS HC A12/MF A01

Two models used for estimating installation costs for residential and intermediate photovoltaic energy systems are summarized. The modeling rationale is reviewed, and the results obtained when the models were applied to 10 residential and 10 intermediate PV systems are listed. Output reports for each of the test cases are appended

N82-11567# Sandia Labs , Livermore, Calif STUDY OF PHOTOVOLTAIC COS COST **ELEMENTS** VOLUME 3: SANDIA NATIONAL LABORATORIES PHO-TOVOLTAIC SYSTEMS DESIGN CATALOG Final Report

James B Ayers Jul 1981 207 p Prepared in cooperation with Barry (Theodore) and Associates, Los Angeles

(Contract DE-AC04-76DP-00789)

(DE81-030986, SAND-81-7014-Vol-3) NTIS HC A10/MF A01

Basic system data sheets, which include project title and location, prime contractor, PV system general description, and energy storage capacity, are shown for 29 intermediate PV systems and 19 residential PV systems. In addition, cost data and output reports generated by TB and A's PV installation cost models are included for 10 intermediate systems and 10 residential

N82-11568# Sandia Labs , Livermore, Calif STUDY OF PHOTOVOLTAIC COST

STUDY OF ELEMENTS. VOLUME 4: INSTALLATION COST MODEL FOR RESIDEN-TIAL PV SYSTEMS: USERS MANUAL Final Report

James B Ayers Jul 1981 89 p Prepared in cooperation

with Barry (Theodore) and Associates, Los Angeles 5 Vol. (Contract DE-ACO4-76DP-00789)

(DE81-031921, SAND-81-7014-Vol-4) HC A05/MF A01

A quantitative methodology is presented for estimating installation costs of residential photovoltaic systems. The installation cost model for residential PV systems is comprised of 144 estimating equations selectively exercised, based on user definition of the system. At the input stage, residential PV systems

can be fully described by 9 design option categories and 9 system specification categories. All assumptions were validated with installers of solar thermal systems. A discussion of the model is included as well as an example of its use with an 8 KW PV system for a Southwest all-electric residential design

N82-11569# Sandia Labs , Livermore, Calif ÖF PHOTOVOLTAIC COST ELEMENTS. VOLUME 5: INSTALLATION COST MODEL FOR INTER-MEDIATE PV SYSTEMS: USERS MANUAL Final Report James B Ayers Jul 1981 137 p Prepared in cooperation with Barry (Theodore) and Associates, Los Angeles 5 Vol (Contract DE-AC04-76DP-00789)

(DE81-030981, SAND-81-7014-Vol-5) HC A07/MF A01

A cost modeling methodology is presented for estimating installation costs associated with intermediate photovoltaic (PV) systems. With only a parametric description of an intermediate power system, the model can be used to develop an installation cost estimate for that system. The model is based on conventional cost-estimating procedures widely used by the construction industry and was validated by comparing estimates for the same 10 systems made independently by a cost engineering firm A description of the model is included as well as an example of its use with a 200 KW solar breeder plant design to be located in Rockville, Maryland

N82-11575# Brookhaven National Lab , Upton, N Y IMPURITY EFFECTS IN a-Si:H SOLAR CELLS

A E Delahoy and R W Griffith 1981 10 p refs Presented at 15th IEEE Photovoltaic Specialists Conf., Orlando, Fla. 12-15 May 1981

(Contract DE-AC02-76CH-00016)

(DE81-025069, BNL-29668, CONF-810526-38) Avail NTIS HC A02/MF A01

The deleterious effects on device performance of phosphine and monochlorosilane are discussed. Solar cells fabricated using plasma deposited a-Si H alloys can be degraded by the incorporation of certain impurities during deposition of the a-Si H materials Nominally intrinsic layers are adversely affected by the addition to the plasma of air, N2 + O2 mixtures, PH3 or SiH3Cl (monochlorosilane) Modification of the a-Si H gap state density owing to synergistic effects of oxygen and nitrogen in the plasma leads to a collapse of the space charge region and the reduction of the micro tau product for holes

N82-11576# Sandia Labs , Livermore, Calif DESIGN, COST AND PERFORMANCE COMPARISONS OF SEVERAL SOLAR THERMAL SYSTEMS FOR PROCESS HEAT. VOLUME 1: EXECUTIVE SUMMARY

Patrick J Eicker, Ernest D Eason, Joe D Hankins, Larry D Hostetler, Joseph J. lannucci, and James B. Woodward. Mar. 1981 24 p refs

(Contract DE-AC04-76DP-00789)

(DE81-029881, SAND-79-8279-Vol-1) NTIS HC A02/MF A01

Conceptual designs of central receiver, parabolic dish, and parabolic trough systems for several process heat applications were analyzed Cost and performance estimates are made for each of these designs and used to calculate levelized delivered process heat costs. This indicated that central receiver systems will provide energy costs competitive with that afforded by the parabolic trough and parabolic dish systems over the range of demand sizes and temperatures studies DOE

Inst of Energy N82-11577# Delaware Univ. Newark Conversion

Zn3P2 AS AN IMPROVED SEMICONDUCTOR FOR PHOTOVOLTAIC SOLAR CELLS Quarterly Report, 1 Dec. 1980 - 28 Feb. 1981

1981 49 p refs Prepared of Midwest Research Inst (DE81-025587, SERI/PR-8062-1-T12, QR-10) Avail NTIS HC A03/MF A01

Zinc oxide zinc solar cells heterojunction devices were studied to establish the origin of the low open circuit voltage. Activation energy determination from JO vs. T-measurements, dark current voltage characteristics, and diffusion volage determination by high frequency capacitance voltage measurements are investigated development oriented Zn3P2 crystals is reported. The optical absorption and photoluminescence spectra of Mg3P2 was

measured, and the diffusion by coefficient of magnesium in Zn3P2 was measured at 750C and 1500C by spectral response method Diffusion of aluminum is also measured. The diffusion voltage of p/n junction devices to improving the fill factor is reported

DOE

N82-11583# Brookhaven National Lab , Upton, N Y Dept of Energy and Environment

SOLAR HEAT PUMP SIMULATOR

M A Catan 1981 5 p refs Presented at the Active Solar Contractors' Rev Meeting, Washington, D C, Sep 1981 (Contract DE-AC02-76CH-00016)

(DE81-024368, BNL-29678, CONF-810912-3) Avail NTIS HC A02/MF A01

A simulator was utilized to provide controlled-temperature sources and sinks to an experimental water-to-water laboratory heat pump test bed. This combination was used to demonstrate and explore the potential of the vapor-compression cycle to deliver high COP's at SAHP source temperatures Results from the simulator were used in computer simulations of complete systems performed by BNL, by the SAHP contractors, and by others. A two-speed compressor was first tested at high source temperatures on the BNL simulator. In view of the decision by both contractors to construct water-to-air (rather than water-towater) heat pumps, the BNL simulator was fitted with an air-side test loop. The prototype heat pump was tested under steady-state conditions on the BNL simulator

N82-11584# Brookhaven National Lab , Upton, N Y Dept of Energy and Environment

LOW-COST SOLAR FLAT-PLATE-COLLECTOR DEVELOP-

W G Wilhelm 1981 5 p Presented at the Active solar Contractors' Rev. Meeting, Washington, D.C., Sep. 1981 (Contract DE-AC02-76CH-00016)

(DE81-025081, BNL-29680, CONF-810912-4) Avail NTIS HC A02/MF A01

Cost goals were developed for the collector which led to the rejection of conventional approaches and to the exploration of thin film technology A thin film solar absorber suited for high speed continous-roll manufacture at low cost was designed The absorber comprises two sheets of aluminum-foil/polymericmaterial laminate bonded together at intervals to form channels with water as the heat transfer fluid. Several flat-plate panels were fabricated and tested

N82-11593# California Univ. Berkeley Lawrence Berkeley Energy and Environment Div

CONTROLS FOR SOLAR HEATING AND COOLING

M Warren, Steven Schiller, and Michael Wahlig Jun 4 p refs Presented at the Active Solar Contractors' Rev Meeting, Washington, D.C., Sep. 1981

(Contract W-7405-eng-48)

(DE81-025209, LBL-12751, CONF-810912-8) Avail NTIS HC A02/MF A01

Solar heating system operation with two different operating strategies were run direct collector to load heating and storage coupled heating. No significant improvement in system performance was found for the direct heating strategy Simulation analysis of the interaction of the solar heating system with the building load and thermostat was completed It is indicated that using a conventional room thermostat, large temperature swings can be expected when the storage tank is charged to a high temperature

N82-11599# Los Alamos Scientific Lab., N Mex TEST RESULTS AND ANALYSIS OF A CONVECTIVE LOOP SOLAR AIR COLLECTOR

Franz A Biehl 1981 6 p refs Presented at the 6th Natl Passive Solar Conf., Portland, Oreg., 8-12 Sep. 1981 (Contract W-7405-eng-36)

(DE81-028151, LA-UR-81-2252, CONF-810925-3) Avail NTIS HC A02/MF A01

The purpose of the test program is to validate simulation model that can also be extended to other collector arrangements and to a variety of weather patterns. Details of the collector configurations, typical test results, simulation model, and comparison between test and analysis results are discussed. The good agreement between test and analysis suggests that the analytical model can be employed for sensitivity studies. A range

of desirable collector lengths, based upon efficiency considerations. was determined employing the analytical model DOE

N82-11600# Los Alamos Scientific Lab , N Mex LONG-TERM PERFORMANCE OF THE HUNN PASSIVE SOLAR RESIDENCE

B D Hunn 1981 6 p refs Presented at 6th Natl Passive Conf , Portland, Oreg , 8-12 Sep 1981 (Contract W-7405-eng-36)

(DE81-028735, LA-UR-81-2251, CONF-810925-6) Avail NTIS HC A02/MF A01

Detailed performance and annual energy consumption data are reported, as well as occupant observations and conclusions, for three heating seasons in the Hunn hybrid passive/active solar residenced located in Los Alamos, New Mexico. The performance data were gathered by the Los Alamos National Laboratory and include hourly storage wall and interior temperature data for a midwinter period, an interior air-temperature histogram, and measured auxiliary energy consumption and solar heating fraction for each heating season Also, energy and cost savings over the three-year period are estimated

N82-11602# Los Alamos Scientific Lab , N Mex HEAT STORAGE DURATION

J Douglas Balcomb 1981 6 p refs Presented at 6th Natl Passive Conf. Portland. Oreg. 8 Sep. 1981 (Contract W-7405-eng-36)

(DE81-026635, LA-UR-81-2186, CONF-810925-4) Avail NTIS HC A02/MF A01

Both the amount and duration of heat storage in massive elements of a passive building are investigated. Data taken or one full winter in a solar home are analyzed with the aid of subsystem simulation models. Heat storage duration is tallied into day intervals. Heat storage location is discussed and related to overall energy flows

N82-11606# Midwest Research Inst., Golden, Colo Solar **Energy Research Inst**

USE OF SOLAR THERMAL ENERGY TO GENERATE ELECTRICITY

L. M. Murphy Jul 1981 22 p refs Presented at Energy in the Man-built Environ The Next Decade Specialty Conf. Vail. Colo , 3-5 Aug 1981, sponsored by ASME (Contracts DE-AC02-77CH-00178, EG-77-C-01-4042)

(DE81-028797, SERI/TP-632-1287, CONF-810808-9) NTIS HC A02/MF A01

Solar thermal electric technology is reviewed Technical approaches which result in net solar to electric conversion efficiencies ranging from less than 1 percent to more than 20 percent are discussed. The status of the various solar thermal electric concepts and the principal areas of research for each respective concept are resited. Cost issues and prospects for the economic competitiveness of solar thermal electric systems DOE with conventional systems are outlined

N82-11609# Midwest Research Inst., Golden, Colo Solar Energy Research Inst

NATIONAL PHOTOVOLTAIC PROGRAM IN AMORPHOUS MATERIALS

Jack Stone, Ed Sabisky, Harry Mahan, Tom McMahon, and Frank Jeffrey May 1981 6 p refs Presented at the 15th Photovoltaic

Specialists Conf., Orlando, Fla. 12-15 May 1981 (Contracts DE-AC02-77CH-00178, EG-77-CH-01-4042)

(DE81-025906, SERI/TP-614-1216) HC A02/MF A01

The development of high efficiency (10% goal), cost effective (15-40 cents per peak watt goal), thin film solar cells is investigated. The status of this program, other research activities, and expected near term performance improvements are summarized DOE

N82-11615# Old North Mfg Co., Inc., Lenoir, N C SOL-CYCLE: A SOLAR-ASSISTED SOLVENT-RECYCLING PROCESS FOR ASPHALT-IMPREGNATION OF FIBER BOARD

Ben E Edwards 1 Apr 1981 12 p

(DE81-903377, NCEI-0031) Avail NTIS HC A02/MF A01 To conserve resources and energy in the production of Flex-Joint, an asphalt-impregnated fiber board, a manufacturing process was developed. The Sol-Cycle process provides for (1) recycle of the solvent used in the saturation step. (2) conversion of raw to finished board in 24 hours, (3) better control of the saturation step, and (4) the use of solar energy for a part of the driving force to accomplish (1) and (2) DOE

N82-11617# Sandia Labs , Albuquerque, N Mex PERFORMANCE TESTING OF THE TOLTEC TI-410 CON-CENTRATING SOLAR COLLECTOR

E Dudley (Edgerton, Germeshausen and Grier, Inc.) and R M Workhoven Jul 1981 55 p refs (Contract DE-AC04-76DP-00789)

SAND-81-0369) (DE81-029994

NTIS Avail

HC A04/MF A01

Results of tests conducted on the collector are summarized Collector efficiency, thermal loss, and receiver differential pressure were measured at fluid temperatures from 20 C to 200 C The collector was evaluated with a glass mirror and with an acrylic/polyester film reflector surface. Four different receiver designs were tested

N82-11622# Lincoln Lab , Mass Inst of Tech , Lexington CARLISLE HOUSE: AN ALL-SOLAR ELECTRIC RESI-

Burt E Nichols and Steven J Strong (Solar Design Associates, Lincoln, Mass) 1981 4 p Presented at the 15th IEEE Photovoltaic Specialist Conf. Orlando, Fla. 11-15 May 1981 Sponsored by DOE

(DOE/ET-20279/133, CONF-810526-16)

HC AQ2/MF AQ1

A solar photovoltaic array on the roof produces electricity, passive solar features provide much of the space heating, thermal collectors provide domestic hot water, and energy conservation measures reduce electrical and thermal energy requirements to a minimum. The overall performance of the system was

N82-11623# Georgia Inst. of Tech., Atlanta School of Social

AN ASSESSMENT OF SELECTED SOLAR ENERGY IN-**DUSTRY ACTIVITIES**

J David Roessner Nov 1980 129 p refs NSF/PRA-80-SP-1187) (PB81-222424.

NTIS

HC AQ7/MF AQ1 CSCL Q5C

The past, present, and near-term conditions of four industries based on solar energy technologies are examined-solar heating, photovoltaics, concentrating solar collectors for process heat and electric power applications, and passive components such as skylights and greenhouses. The report identifies key, unresolved issues for government policies intended to influence future solar industrial development, assesses the past and current federal role in these industries, and draws tentative conclusions about how government policies have affected their evolution This evolution is compared to the evolution of typical, innovationbased industries. For each of the four solar industries researched, the collected data are discussed as follows characteristics of sales, the government role, investment strategies and R & D activities, near-term trends, and comparisons with other industries

N82-11625# Rensselaer Polytechnic Inst., Troy, N Y Dept of Mechanical Engineering, Aeronautical Engineering and Mechanics

THE ROGERS FOCUSING HELIOSTAT EXPERIMENTAL PROGRAM AT RENSSELAER POLYTECHNIC INSTITUTE
W E Rogers. D N Borton, and M P Rice Dec 1980 39 p Sponsored by New York State Energy Research and Development Authority

(PB81-226813, Rept-80-24, NYSERDA-80-24) Avail NTIS HC A03/MF A01 CSCL 10A

A research effort to develop a solar collector package designed specifically with the needs and solar resources of the Northeast in mind is described. The heliostat is a concentrating solar collector which is 30 feet high, 34 feet wide and has 864 square feet of mirror concentrator Electric controls move the structure so it tracks the path of the Sun as it rises and sets and moves across the sky When the Sun is not shinning, the mirrors turn down, shielding them from the dirt, ice and snow However, when it rains the mirrors turn up for cleaning, helping to keep

them in peak operating condition. The heliostat's design incorporates a concentrating capability which takes the diffuse energy of the Sun and focuses it, creating temperatures of more than 3,600 F and producing enough steam as a result to displace 70 kW of electricity at peak operation. The unit tested in this demonstration was used for space heating, and domestic hot water as well as to fire an absorption air conditioner

N82-12279# Aerospace Corp. El Segundo, Calif Energy and Resources Div

SOLAR HEATING AND COOLING OF BUILDINGS (SHA-COB): REQUIREMENTS DEFINITION AND IMPACT ANALYSIS-2. VOLUME 2: DOMESTIC HOT WATER SYSTEMS

C K Cretcher Nov 1980 121 p refs Sponsored by Electric Power Research Inst

(EPRI Proj 553-2)

(DE82-900207. EPRI-EM-1506-Vol-2) NTIS Avail

HC A06/MF A01

The various types of solar domestic hot water systems are discussed including their advantages and disadvantages. The problems that occur in hydronic solar heating systems are reviewed with emphasis on domestic hot water applications. System problems in retrofitting of residential buildings are also discussed including structural and space constraints for various components and subsystems. System design parameters include various collector sizing methods, collector orientation, storage capacity and heat loss from pipes and tanks. The installation costs are broken down by components and subsystems. The approach used for utility economic impact analysis is reviewed. The simulation is described, and the results of the economic impact analysis are given. A summary assessment is included

N82-12280# Aerospace Corp , El Segundo, Calif Energy and Resources Div

SOLAR HEATING AND COOLING OF BUILDINGS (SHA-COB): REQUIREMENTS DEFINITION AND IMPACT ANALYSIS-2. VOLUME 3: CUSTOMER LOAD MANAGE-MENT SYSTEMS

C K Cretcher and R C Rountredd Nov 1980 87 p refs Sponsored by Electric Power Research Inst

(EPRI Proj 553-2) (DE82-900208.

EPRI-EM-1506-Vol-3) Avail. NTIS

HC A05/MF A01

Customer Load Management Systems, using off-peak storage and control at the residences, are analyzed to determine their potential for capacity and energy savings by the electric utility Areas broadly representative of utilities in the regions around Washington, DC and Albuquerque, NM were of interest Near optimum tank volumes were determined for both service areas, and charging duration/off-time were identified as having the greatest influence on tank performance. The impacts on utility operations and corresponding utility/customer economics were determined in terms of delta demands used to estimate the utilities' generating capacity differences between the conventional load management, (CLM) direct solar with load management (DSLM), and electric resistive systems. Energy differences are also determined These capacity and energy deltas are translated into changes in utility costs due to penetration of the CLM or DSLM systems into electric resistive markets in the snapshot years of 1990 and 2000

N82-12540* # Boeing Aerospace Co , Seattle, Wash SPS LARGE ARRAY SIMULATION

S Rathjen, B R Sperber, and Ervin J Nalos In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 14-23

Avail NTIS HC A99/MF A01 CSCL 10A

The computer programming efforts were directed primarily to beam pattern analysis. The computer programs used for simulation provide verification of the reference design, definition of teasible departures such as quantized distributions, the study of far-out sidelobe roll-off characteristics, the analysis of errors and failures, illumination function analysis to develop beam patterns for efficient collection, and beam shaping synthesis to meet environmental constraints

N82-12544*# LinCom Corp., Pasadena, Calif PERFORMANCE ANALYSIS AND SIMULATION OF THE SPS

02 SOLAH ENERGY

REFERENCE PHASE CONTROL SYSTEM

W C. Lindsey and C M Chie In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 58-74 refs

(Contract NAS9-15782)

Avail NTIS HC A99/MF A01 CSCL 10A

Key results pertinent to the SPS reference phase control system design are summarized. These results are a consequence of extensive system engineering tradeoffs provided via mathematical modeling, optimization, analysis and the development/ utilization of a computer simulation tool called SOLARSIM TM

N82-12545*# Lockheed Engineering and Management Services Co., Inc., Houston, Tex.

DESIGN AND BREADBOARD EVALUATION OF THE SPS REFERENCE PHASE CONTROL SYSTEM CONCEPT

P M Hopkins and V R Rao In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 75-84

(Contract NAS9-15800)

Avail NTIS HC A99/MF A01 CSCL 10A

Efficient operation of a very large phased array such as the proposed solar power satellite, requires precision focusing and pointing of the power beam, i.e., the power beam must have a planar wavefront directed precisely at the center of the target antenna (rectenna). To maintain such a power beam requires real-time phase compensation at each subaperture in order to adjust for structural deformations and other transitory factors. In the current solar power satellite (SPS) baseline, the spaceborne antenna (Spacetenna) is an active retrodirective array A pilot signal transmitted from the center of the rectenna is phaseconjugated at each subaperture (power module) of the spacetenna, thereby assuring that the radiated composite wave is focused on the target. This scheme requires a large amount of precision. electronic circultry on the spacetenna. Specifically, pilot receivers must be located at each power module and an adaptive distribution network is required in order to provide a properly phased reference signal at each conjugator

N82-12578# Mazria (Edward) and Associates, Albuquerque, N Mex

PASSIVE SOLAR TECHNICAL PLANNING STUDY

Edward Mazria and M. S. Baker. Oct. 1980, 120 p. refs. EPRI-TPS-79-750) (EPRI-EM-1591. Avail HC A06/MF A01

The most promising passive solar techniques in buildings and their potential impact on electric utilities are examined. The differences between passive design and good energy conservation practices and the correlation between the passive solar contribution relative to reducing the building load from normal design practices are addressed. The potential for passive solar systems to alter residential load profiles, especially to reduce peaks for back-up energy needs is discussed. Computer code analysis techniques and capabilities required to simulate passive designs are presented

N82-12598# Arizona Univ., Tucson Solar Energy Research Facility

GUIDEBOOK FOR SOLAR PROCESS-HEAT APPLICA-TIONS

Rocco Fazzolare, George Mignon, Leonel Campoy, and Francisco Luttmann Jan 1981 169 p refs (DE81-027977, DOE/TIC-1027977)

NTIS

HC A08/MF A01

The potential for solar process heat in Arizona and some of the general technical aspects of solar, such as insolation, siting, and process analysis are explored. Major aspects of a solar plant design are presented Collectors, storage, and heat exchange are discussed. Reducing hardware costs to annual dollar benefits is also discussed Rate of return, cash flow, and payback are discussed as they relate to solar systems. Design analysis procedures are presented. The design cost optimization techniques using a yearly computer simulation of a solar process operation is demonstrated

N82-12599# International Energy Agency, Paris (France) OPTIMIZATION OF SOLAR HEATING AND COOLING SYSTEMS

T L. Freeman (Atlas Corp., Santa Cruz, Calif.) Jun 1981 56 p refs (NP-1903997) Avail NTIS (US Sales Only) HC A04/MF A01,

DOE Depository Libraries

A review of general techniques and specific methods useful in the optimization of solar heating and cooling systems is undertaken. A discussion of the state of the art and the principal problems in both the simplified thermal performance analysis and economic analysis portions of the optimization problem are presented Sample economic analyses are performed using several widely used economic criteria. The predicted thermal results of one typical, widely used simplified method is compared to detailed simulation results. A methodology for and the results of a sensitivity study of key economic parameters in the life cycle cost method are presented Finally, a simple graphical optimization technique based on the life cycle cost method is proposed

N82-12600# Brookhaven National Lab , Upton, N Y Technology and Data Div

COMPARATIVE ECONOMIC PERFORMANCE OF SELECTED PASSIVE SOLAR HEATING AND COOLING TECHNOLOG-

W Rutter May 1981 24 p refs (Contract DE-AC02-76CH-00016)

(DE81-030220, BNL-51394) Avail. NTIS HC A02/MF A01

The economic performance of selected passive solar heating and cooling technologies which incorporate energy storage is assessed by using a set of uniform assumptions and methodologies. Where data are available, a given system is assessed at more than one geographical location. Results are obtained in the form of both payback period and net present value for residential applications, and in terms of net present value only for industrial/commercial uses. Results indicate that ventilated trombe walls, solar roof ponds, and certain night effect/floor storage strategies are cost effective, but night effect/rock bed cooling is not Results also show that, although direct gain out-performs trombe walls in most parts of the country, both direct gain and trombe walls usually produce a net savings in the residential sector Generally, nowever, tax regulations result in net economic loss for direct gain and trombe walls used to heat industrial and commercial buildings DOE

N82-12601# Sandia Labs, Albuquerque, N Mex Thermal Sciences Div COMPARATIVE ECONOMICS OF SOLAR THERMAL **CENTRAL RECEIVERS**

Miriam J Fish Aug 1981 56 p refs (Contract DE-AC04-76DP-00789) (DE81-029623. SAND-81-8236)

NTIS Avail.

HC A04/MF A01

For both electrical and industrial process heat (IPH) generation, central receivers compare favorably with oil and gas, and in many cases, coal Calculational results are presented in which the levelized energy costs from central receiver plants are compared with those from oil, gas, and coal fired plants. Both electrical and IPH applications are discussed Uncertainties in future capital costs, fuel price escalation rates, and the underlying economic climate are included in the analysis

N82-12602# Boeing Computer Services, Inc., Seattle, Wash INTERMEDIATE PHOTOVOLTAIC SYSTEM APPLICATION EXPERIMENT OPERATIONAL PERFORMANCE: EXECU-TIVE SUMMARY. VOLUME 1: FOR NEWMAN POWER STATION, EL PASO, TEXAS

Aug 1981 9 p (Contract DE-ACO4-76DP-00789)

(DE81-031934, SAND-81-7100-Vol-1, MR-14) Avail NTIS HC A02/MF A01

The data given for a 20 kWp photovoltaic flat panel power system for an uninterruptable power supply load includes total electrical energy produced during the month of June 1981, and for each day of the month, total incident solar energy in the plane of the collector during the month and for each day of the month, and array efficiency. The monthly average direct normal insolation during the month during daylight hours is also T.M. reported

N82-12608# Motorola, Inc., Phoenix, Ariz PHOTOVOLTAIC MECHANISMS IN POLYCRYSTALLINE THIN FILM SILICON SOLAR CELLS Quarterly Technical Progress Report, 1 Feb. - 30 Apr. 1981

Bhushan Sopori 29 Aug 1981 43 p refs

(Contract DE-AC02-77CH-00178)

(DE81-030370, DOE/SERI-9234/3, QTPR-3) Avail NTIS

HC A03/MF A01

Efforts are described in developing a technique for rapid identification of isolated line dislocations and dislocation networks in RTR ribbons. This was accomplished by extending the technique of Cu decoration to determine defect propagation in polycrystalline substrates. The basic characteristics of (100) textured surfaces are described, followed by a ray optics approach towards the analysis of textured surfaces with and without AR coatings The technique of optimization is demonstrated for a standard cell and an ultraviolet cell

N82-12609# Massachusetts Inst of Tech , Cambridge PHOTOVOLTAIC MARKET ANALYSIS PROGRAM: BACK-GROUND, MODEL DEVELOPMENT, APPLICATIONS AND EXTENSIONS

Gary L Lilien and Frank H Fuller Apr 1981 158 p refs

(Contract DE-AMO1-76EI-02295)

(DE81-029711. MIT-EL-81-012)

HC A08/MF A01

Tools and procedures to help guide government spending decisions associated with stimulating photovoltaic market penetration were developed. The program has three main components (1) theoretical analysis aimed at understanding qualitatively what general types of policies are likely to be most cost effective in stimulating PV market penetration; (2) operational model developent (PV1), providing a user oriented tool to study quantitatively the relative effectiveness of specific government spending options and (3) field measurements, aimed at providing objective estimates of the parameters used in the diffusion model used in PV1. Existing models of solar technology diffusion are reviewed and the structure of the PV1 model is described Theoretical results on optimal strategies for spending federal market development and subsidy funds are reviewed. The validity of these results is checked by comparing them with PV1 projections of penetration and cost forecasts for 15 government policy strategies which are simulated on the PV1 model

N82-12610# Massachusetts Inst of Tech, Cambridge COST GOALS FOR A RESIDENTIAL PHOTOVOLTAIC/ THERMAL LIQUID COLLECTOR SYSTEM SET IN THREE NORTHERN LOCATIONS

Thomas L Dinwoodie and John P Kavanaugh Oct 1980 61 p

(Contract DE-AC02-76ET-20279)

(DE81-029700. MIT-EL-80-028)

HC A04/MF A01

Avail NTIS

The allowable costs for a residential PV/T liquid collector system are compared with those of both PV only and side-by-side PV and thermal collector systems Four typs of conventional energy systems provide backup all oil, all gas, all electric resistance, and electric resistance hot water with space heating by parallel heat pump Electric space cooling is modeled, and the electric utility serves as backup for all electrical needs. The analysis is separated into two parts (1) a base case study using conservative market and financial parameters for comparing PV/T economics in three northern locations, and (2) the sensitivity of PV/T economics to pertinent physical, market, and financial variables is examined. The difference in economic outlook for PV/T in retrofit applications is also estimated it is indicated that, it for northern locations modeled, is less than that of separate (side-by-side) collector systems, at total array areas between 40-80 sq m Below this range, allowable costs diverge, benefiting optimally sized separate collector systems DOE

N82-12611# Midwest Research Inst , Perth (Australia) Solar Energy Research Inst.

STATUS OF SOLAR ENERGY RESEARCH AND DEVELOP-MENT IN AUSTRALIA

Susan G Saunders May 1981 28 p refs Presented at the Solar Systems Develop Assoc, Tokyo, 27 May 1981 (NP-1903916, Rept-1007) Avail NTIS HC A03/MF A01

The solar energy research and development program in Australia is described Programs with promise of widespread application researched are (1) solar industrial process heat, (2) solar air conditioning, (3) solar electricity production, and (4) biomass fuels

N82-12612# Mid-American Solar Energy Complex, Minneapolis,

SOLAR ENERGY INFORMATION DATA BANK (SEIDB) PROGRAM, FY 1981 Final Project Report

Jun 1981 24 p

(Contract DE-AC02-79CS-30150)

MASEC/R-81-074) (DF81-030054.

NTIS Avail

HC A02/MF A01

The background, program objectives, technical highlights, FY 81 program activity, and recommendations for the SEIDB are

N82-12615# Midwest Research Inst., Golden, Colo Solar Energy Research Inst

NEAR-TERM IMPROVEMENTS IN PARABOLIC TROUGHS: AN ECONOMIC AND PERFORMANCE ASSESSMENT

R Gee and L M Murphy Aug 1981 54 p refs

(Contract DE-AC02-77CH-00178) SERI/TR-632-870)

(DE82-001158,

NTIS

HC A04/MF A01

HC A04/MF A01

Improved parabolic trough concentrating collectors which result from better design, improved fabrication techniques, and the development and utilization of improved materials are analyzed The improvements considered are evacuated receivers, silvered glass reflectors, improved receiver, selective coatings, higher optical accuracy concentrations, and higher transmittance receiver glazings. Upper bound costs for each improvement are provided as well as estimates of the increased solar system rates of return that are made possible by these improvements It is shown that the performance and economic potential of these improvements are substantial, especially at higher collector operating temperatures

N82-12616# Sandia Labs , Albuquerque, N Mex Theoretical

USER'S GUIDE TO HELIOS: A COMPUTER PROGRAM FOR MODELING THE OPTICAL BEHAVIOR OF REFLECTING SOLAR CONCENTRATORS PART 1: INTRODUCTION AND CODE INPUT

C N Vittitoe and Frank Biggs Aug 1981 64 p refs (Contract DE-AC04-76DP-00789) (DE81-031920 SAND-81-1180-Pt-1)

HELÍOS is a flexible computer code for evaluating designs for central receiver, parabolic dish, and other reflecting solar energy collector systems, for safety calculations on the threat to personnel and to the facility itself, for determination of how various input parameters alter the power collected, for design trade offs, and for heliostat evaluations. Input variables include atmospheric transmission effects, reflector shape and surface errors suntracking errors focusing and alignment strategies, receiver design, placement positions of the tower and mirrors, and time of day and day of the year for the calculation. Complete input instructions and a description of the code structure are DOE

N82-12618# Sandia Labs , Livermore, Calif Thermal Sciences

SOLAR THERMAL CENTRAL RECEIVERS FOR INDUSTRIAL PROCESS HEAT GENERATION: USER VIEWS AND RECOMMENDATIONS FOR COMMERCIALIZATION

M J Fish Aug 1981 66 p refs (Contract DE-AC04-76DP-00789)

(DE81-029611, SAND-81-8235) HC A04/MF A01

NTIS

NTIS

Results of recent meetings with several private industrial groups in which solar thermal central receivers were discussed in depth as a potential for industrial process heat generation are summarized Topics covering potential economics, technical requirements, and actions to promote commercialization of the technology are presented. These findings are then translated into recommendations for commercialization in private industrial markets Key points include the need for small scale systems integration projects in addition to the 10 MW/sub e/ plant under construction at Barstow, CA, and the adoption of financial incentives, such as tax credits, for getting the early commercial DOF plants built

N82-12623# Midwest Research Inst , Golden, Colo FLEXIBILITIES IN PASSIVE DESIGN: EXAMINING SOME LIMITING SOLAR MYTHS

02 SOLAR ENERGY

R G Derickson and K S Sadlon Jul 1981 5 p refs Presented at 6th Natl Passive Conf., Portland, Oreg., 8 Sep. 1981 (Contract DE-AC02-77CH-00178)

(DE81-028401, SERI/TP-721-1342, CONF-810925-15) Avail NTIS HC A02/MF A01

Frequently cited rules-of-thumb or general guidelines that needlessly limit designer choice and freedom are examined. It is found that a rectangular design with an E-W elongation is not really essential to proper passive design, east and west windows do not necessarily detract from passive heating performance or negatively impact cooling efficiency, and a passive house need not be crammed with thermal mass. Some flexible design alternatives are explored and factors other than E-W elongation, windows, and thermal mass are considered

N82-12624# Westinghouse Electric Corp., East Pittsburgh, Pa Advanced Systems Technology Div

ECONOMIC ASSESSMENT OF ADVANCED CENTRAL-RECEIVER SOLAR-THERMAL POWER SYSTEMS: EXECU-TIVE SUMMARY
Oct 1980 23 p refs
(Contract DE-AC03-79SF-10601)

(DOE/SF-10601/0) Avail NTIS HC A02/MF A01

The value and potential electric utility impact of several advanced central receiver solar thermal plant concepts in the role of electric generating stations were estimated Economics, the cost of producing electricity, fuels displaced, and utility system reliability are examined. The central receiver plants evaluated included solar/fossil hybrid concepts and solar stand-alone plants with thermal storage It is indicated that if the cost goals are achieved and projected solar plant performance attained, the advanced solar thermal concepts can be competitive in regions with good insolation and some continued use of oil or other surrogate distillate or gaseous fuels DOE

N82-12625# Oak Ridge National Lab , Tenn Energy Div SEASONAL PERFORMANCE FACTORS FOR ACTIVE SOLAR SYSTEMS AND HEAT-PUMP SYSTEMS

R L Reid and L A Abbatiello 1981 7 p refs Presented at the IECEC Conf., Atlanta, 9 Aug 1981 (Contract W-7405-eng-26)

(DE81-028569. CONF-810812-35) NTIS Avail HC A02/MF A01

Methods of evaluating solar systems are discussed and compared Heating seasonal performance factor (SPFH) and annual coefficient of performance (ACOP) are selected as being of the most vaue to the consumer in determining his purchased energy requirements and also allow the direct comparison of solar and heat pump systems. A search of the literature produced seasonal or annual data from 20 solar and 12 heat pump systems that were instrumented well enough to measure the loads and energy consumptions necessary to calculate the SPFH and/or ACOP Tables of these results show that well-designed solar systems have SPFHs of 16 to 28 compared to heat pump SPFHs of 1 6 to 2 0 However, the heat pump Annual Cycle Energy System ACOP was measured as 3.1 compared to a projected maximum ACOP for a solar system with heat pump cooling of 24 to 28

N82-12626# Midwest Research Inst., Golden, Colo Solar **Energy Research Inst**

PERFORMANCE ANALYSIS OF 11 DENVER METRO PASSIVE HOMES

D E Claridge Jul 1981 7 p refs Presented at the AS/ISES 6th Natl Passive Solar Conf., Portland, Oreg., 8-12 Sep 1981 (Contracts DE-AC02-77CH-00178, EG-77-C-01-4042) (DE81-025473, SERI/TP-721-1325, CONF-810925-12) Avail NTIS HC A02/MF A01

The auxiliary heating requirements for 11 passive solar homes were calculated using SLR or SUNCAT-2 4 with a standard set of basic assumptions. It is shown that seven of the homes should use less than half as much heating fuel as typical houses, two should use about half, and two should use about two-thirds or more. These results are compared with performance estimates and show large discrepancies. Differences are attributed largely to specific differences in assumptions in every case but DOE

N82-12627# Midwest Research Inst., Golden, Colo Solar Energy Research Inst

SUMMERTIME RESULTS FROM THE CLASS B PASSIVE-SOLAR PERFORMANCE-MONITORING PROGRAM

J Swisher Jul 1981 3 p Presented at the 6th Natl Passive Solar Conf. Portland, Oreg., 8-12 Sep 1981 (Contracts DE-AC02-77CH-00178, EG-77-C-01-4042) (DE81-025471, SERI/TP-721-1317, CONF-810925-8) Avail NTIS HC A02/MF A01

The program is designed to provide, at relatively low cost, accurate and consistent real-time estimates of building thermal performance, as well as detailed data regarding climate, indoor temperatures, and purchased energy needs. As part of this program, a microprocessor-based data acquisition system was installed in each of ten passive solar houses in the Denver area, primarily to evaluate heating-season performance. During the summer, however, the monitoring systems are used to study the overheating tendencies of the buildings. Examination of the conditions that lead to overheating, using graphical and statistical techniques, will provide insight into the solar design practices that provide the most comfortable summer environment

N82-12628# Midwest Research Inst., Golden, Colo Solar **Energy Research Inst** SOLAR EXPLOSION

B C Baccer Apr 1981 5 p Presented at the 6th Natl Passive Solar Conf., Portland, Oreg., 8-12 Sep. 1981 (Contracts DE-AC02-77CH-00178, EG-77-C-01-4042) (DE81-026086, SERI/TP-721-1167R, CONF-810925-13) Avail

NTIS HC A02/MF A01 The Solar Energy Research Institute (SERI) and the Department of Energy (DOE) Passive Solar Manufactured Buildings and Solar Home Builders Programs are developing much needed cost

and performance data on solar buildings produced by large-volume home punders. These programs also serve as a model on how government can work effectively with industry DOF

N82-12629# Los Alamos Scientific Lab , N Mex PASSIVE-SOLAR-RETROFIT STUDY FOR THE UNITED STATES NAVY

William O Wray and Charles R Miles (Naval Civil Engineering Lab) 1981 6 p refs Presented at the 6th Natl Passive Solar Conf. Portland, Oreg. 8-12 Sep 1981 (Contract W-7405-eng-36)

(DE81-028921, LA-UR-81-2200, CONF-810925-7) Avail NTIS HC A02/MF A01

A passive solar retrofit study was conducted to determine the energy savings obtainable in concrete block buildings from several passive solar heating strategies. Test cell data and computer simulation were employed to assess the merits of six retrofit options. The six strategies selected were chosen on the basis of providing a series of options that deliver increasing energy savings at the cost of correspondingly increased levels of commitment

N82-12630# Los Alamos Scientific Lab , N Mex **ECONOMIC IMPLICATIONS OF PASSIVE-SOLAR RETROFIT** FOR SINGLE-FAMILY RESIDENCES IN ALBUQUERQUE, NEW MEXICO: A CASE STUDY

S W Martin (Public Service Company of New Mexico, Albuquerque) Jun 1981 125 p refs (Contract W-7405-eng-36)

(DE81-028402, LA-8892-T) Avail NTIS HC A06/MF A01 Certain economic criteria are used to evaluate the potential of retrofitted passive solar systems. Actual system and labor costs along with calculated Input-Output income and employment multipliers are used to estimate changes in income and employment levels within the study area. Estimates of changing energy use patterns also are presented. The methodology presented can be expanded to include other technologies and can be used to examine other potential scenarios DOE

N82-12632# Sandia Labs , Albuquerque, N Mex Div of Solar Technology DEPARTMENT OF ENERGY SOLAR CENTRAL RECEIVER SEMIANNUAL MEETING

Jan 1981 273 p refs Meeting held in San Francisco, 15-16 Oct , 1980

(Contract DE-AC04-76DP-00789)

(SAND-80-8049. CONF-8010129) NTIS

HC A12/MF A01

The goals and current status of the solar thermal program were reviewed. The organization of the program is discussed, as

is funding for fiscal year 1981. Technical progress and future prospects are discussed

N82-12840# Nationale Raad voor Landbouwkundig Onderzoek TNO, The Hague (Netherlands)

BASIS FOR RESEARCH PROPOSALS CONCERNING (INDUSTRIAL) SOLAR ENERGY PRODUCTION PROCESSES DERIVED FROM BIOLOGICAL PRINCIPLES [BASIS VOOR ONDERZOEKVOORSTELLEN BETREFFENDE IIN-DUSTRIEELE) ZONNE-ENERGIEWINNINGSPROCESSEN AFGELEID VAN BIOLOGISCHE PRINCIPES

1980 96 p refs in DUTCH Avail NTIS HC A05/MF A01

The economic feasibility of photochemical conversion systems for solar energy production processes derived from biological principles was studied A global energy analysis shows that the period during which a solar energy installation has to deliver energy in order to regain the energy required for the construction is about one-seventh or one-eighth of its lifetime (10 times longer than conventional installations) Energy production with the help of photocatalytic systems in western Europe is only economical if the net conversion efficiency is substantially increased above 15% Complex photocatalytic processes or combined photoelectric, photochemical and thermal mechanisms may be applied, i.e., coproduction, combining a photovoltaic or photocatalytic process with solar heat production or combining several photocatalytic systems. A tentative evaluation of conversion processes for solar energy is presented Author (ESA)

N82-12642# Ludwig-Maximilians-Universitaet, Munich (West Germany) "Inst fuer Experimentalphysik

IMPROVEMENT OF THERMAL EFFICIENCY OF FLAT PLATE **SOLAR COLLECTORS** Final Report

Hubert Boeck, Reinhard Hallermayer, Wolfgang Schoelkopf, and Alfred Wiesmeth Bonn Bundesministerium füer Forschung und Technologie Dec 1980 62 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und

(BMFT-FB-T-80-194, ISSN-0340-7608) Avail HC A04/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 13

Measuring methods (spectral resolution of absorptivity and the evaluation of overall absorptivity with a solar spectrum) and further developed (calorimetric device to measure the hemispherical thermal emissivity of various speciments) were examined The convective heat transfer between cover and absorber of a flat plate collector is partially suppressed by various inserted structures The optical transmission of the cover of flat plate collectors is improved by interference layers. Thus an improvement is important when a correct azimuthal orientation of the collector is impossible Results of an experimental comparative test of several commercial flat plate collectors are presented

Author (ESA)

N82-12644# Technical Research Centre of Finland, Espoo LVI-Tekniikan Lab

THE PROPERTIES OF SOLAR AND HEAT PUMP HEATING SYSTEMS OF SMALL HOUSES AND ADDITIONAL HEAT

Tino Kalema and Kari Wellman Apr 1981 121 p refs in FINNISH, ENGLISH summary

(VTT-56, ISBN-951-38-1199-9, ISSN-0355-3469, RISO-M2241) Avail NTIS HC A06/MF A01

The active use of solar energy in heating of small houses was studied with a computer program developed for this purpose The calculations clear up the thermal properties of seven solar and heat pump systems with different operational principles. The following topics are studied (1) how much energy is obtained from different heat sources (basic heat source, solar radiation, earth and wood), and (2) the influence of collector size, structure, and storage on the energy obtained from the collector in each system The influence of the size and depth of the heat pump Earth pipes on compressor electricity consumption, Earth temperatures and freezing are also studied Author (ESA)

N82-12647# Joint Publications Research Service, Arlington,

SOLAR PROJECT AT ALMERIA NEARS COMPLETION Hans Fricker In its W Europe Rept Sci and Technol, No 72 (JPRS-78876) 1 Sep 1981 p 15-17 Transl into ENGLISH from Chem Rundschau (Zurich), 25 May 1981 p 3 and 5

Avail NTIS HC A03/MF A01

Ninety-three mirrors (heliostats), steered by a computer, reflect the sunlight at all times of the day and year into the opening of a combustion chamber (receiver) mounted on a 43-meter high tower in southern Spain. The cooling medium, liquid sodium, is heated from 270 C to 530 C, after which it flows to the hot storage tank installed on the ground below. As needed, sodium can be circulated out of the tank through the steam generator into a cold storage tank and from there back to be reheated in the receiver. The steam created in the steam generator expands in a steam engine, the mechanical energy created there drives the 500 kW generator, which produces the electric power The selection of sodium as the cooling medium, and the design of the receiver and the pressure relief system which guarantees the safety of the plant in the unlikely event of a steam pipe bursting are described

N82-12707# Automation Industries, Inc., Silver Spring, Md Vitro Labs Div

ENVIRONMENTAL DATA FOR SITES IN THE NATIONAL SOLAR DATA NETWORK

Aug 1981 176 p Prepared for Argonne National Lab (Contract DE-AC01-79CS-30027) SOLAR/0010-81/08) (DE82-000071. NTIS HC A09/MF A01

Environmental information collected at the sites of the National Solar Data Network is tabulated for each solar site. The sites are grouped into 12 zones, each of which consists of several adjacent states. The insolation table presents the total, diffuse, direct, maximum, and extraterrestrial radiation for the site it also shows the ratio of total to extraterrestrial radiation. The temperature table gives the average, daytime, nighttime, maximum, minimum, and inlet-water temperature for the site All of the passive and some active solar sites are equipped with wind sensors which provide information on wind speed and direction. For some sites, a humidity tables provides relative humidity values for day and night. It also gives values for the maximum and minimum humidity for each day. A technical discussion of the instruments and measurements used to obtain the data is included

N82-13039*# Hughes Research Labs, Malibu, Calif STUDY OF RADIATIVELY SUSTAINED CESIUM PLASMAS FOR SOLAR ENERGY CONVERSION Final Report, 1 Jul. 1978 - 30 Jun. 1980

A J Palmer and G J Dunning Jul 1980 67 p refs (Contract NAS2-10001) (NASA-CR-166265) Avail NTIS HC A04/MF A01 CSCL

10A The results of a study aimed at developing a high temperature solar electric converter are reported. The converter concept is based on the use of an alkalı plasma to serve as both an efficient high temperature collector of solar radiation as well as the working fluid for a high temperature working cycle. The working cycle is a simple magnetohydrodynamic (MHD) Rankine cycle employing a solid electrode Faraday MHD channel Research milestones include the construction of a theoretical model for coupling sunlight in a cesium plasma and the experimental demonstration of cesium plasma heating with a solar simulator in excellent agreement with the theory. Analysis of a solar MHD working cycle in which excimer laser power rather than electric power is extracted is also presented. The analysis predicts a positive gain coefficient on the cesium-xenon excimer laser transition RJE

N82-13265# Midwest Research Inst., Golden, Colo Energy Research Inst

NTIS

APPLIANCE EFFICIENCY AND THE SOLAR BUILDING

Joel Swisher Jun 1981 30 p refs (Contracts EG-77-C-01-4042, DE-AC02-77CH-00178) SERI/TR-721-1119) (DE81-029073. HC A03/MF A01

Energy use in residential appliances is examined Current appliance energy use was evaluated and technologically feasible improvements were studied. A typical set of household appliances was developed, and modified by three classes of efficiency improvements. Significant energy saving potential was found in all major appliance energy uses, with the largest savings in

water heaters and refrigerators. Costs of the improvements are relatively low, providing short payback times. The effects of the improvements on building thermal loads and electricity demand profiles were also examined

N82-13491*# Jet Propulsion Lab , California Inst of Tech ,

SPACE APPLICABLE DOE PHOTOVOLTAIC TECHNOLOGY: AN UPDATE

J Scott-Monck, P Stella, and P Berman 15 Nov 1981 25 p refs

(Contract NAS7-100)

(NASA-CR-165021, JPL-Pub-81-91) NTIS Avail HC A02/MF A01 CSCL 10A

Photovoltaic development projects applicable to space power are identified. When appropriate, the type of NASA support that would be necessary to implement these technologies for space use is indicated. It is conducted that the relatively small market and divergent operational requirements for space power are mainly responsible for the limited transfer of terrestrial technology to space applications. Information on the factors which control the cost and type of technology is provided. Terrestrial modules using semiconductor materials are investigated

N82-13492*# Jet Propulsion Lab., California Inst. of Tech.,

DISTRIBUTED PHOTOVOLTAIC SYSTEMS: INTERFACE ISSUES AND THEIR PRESENT STATUS

M Hassan and J Klein 15 Sep 1981 166 p refs (Contracts NAS7-100 DE-AI01-76ET-20356 Pro 5240-11)

(NASA-CR-165019 JPL-Pub-81-89, DOE/ET-20356/3) Avail NTIS HC A08/MF A01 CSCL 10A

Major technical issues involving the integration of distributed photovoltaics (PV) into electric utility systems are defined and their impacts are described quantitatively. An extensive literature search, interviews, and analysis yielded information about the work in progress and highlighted problem areas in which additional work and research are needed. The findings from the literature search were used to determine whether satisfactory solutions to the problems exist or whether satisfactory approaches to a solution are underway it was discovered that very few standards, specifications, or guidelines currently exist that will aid industry in integrating PV into the utility system. Specific areas of concern identified are (1) protection, (2) stability, (3) system unbalance, (4) voltage regulation and reactive power requirements, (5) harmonics, (6) utility operations, (7) safety, (8) metering, and

(9) distribution system planning and design Author

N82-13495*# Jet Propulsion Lab , California Inst of Tech , DISH STIRLING SOLAR RECEIVER COMBUSTOR TEST

PROGRAM C P Bankston and L. H Back 15 Aug 1981 45 p refs (Contracts NAS7-100, DE-AI01-81ET-20307, JPL Proj 5105-76)

(NASA-CR-165017, JPL-Pub-81-23, DOE/JPL-1060-41) Avail NTIS HC A03/MF A01 CSCL 10A

The operational and energy transfer characteristics of the Dish Stirling Solar Receiver (DSSR) combustor/heat exchanger system was evaluated The DSSR is designed to operate with fossil fuel augmentation utilizing a swirl combustor and cross flow heat exchanger consisting of a single row of 4 closely spaced tubes that are curved into a conical shape. The performance of the combustor/heat exchanger system without a Stirling engine was studied over a range of operating conditions and output levels using water as the working fluid Results show that the combustor may be started under cold conditions, controlled safety, and operated at a constant air/fuel ratio (10 percent excess air) over the required range of firing rates. Furthermore, nondimensional heat transfer coefficients based on total heat transfer are plotted versus Reynolds number and compared with literature data taken for single rows of closely spaced tubes perpendicular to cross flow. The data show enhanced heat transfer for the present geometry and test conditions. Analysis of the results shows that the present system meets specified thermal requirements, thus verifying the feasibility of the DSSR combustor design for final prototype fabrication

N82-13496*# Solarex Corp., Rockville, Md A MODULE EXPERIMENTAL PROCESS SYSTEM DEVELOP- MENT UNIT (MEPSDU) Quarterly Report, 1 May - 31 Aug.

31 Aug 1981 57 p refs Sponsored in part by DOE Prepared for JPL, Pasadena

(Contract JPL-955902)

(NASA-CR-165014 OR-3 JPL-9950-603)

DOE/JPL-955902-81/3) Avail NTIS HC A04/MF A01 CSCL 10A

A cost effective process sequence and machinery for the production of flat plate photovoltaic modules are described. Cells were fabricated using the process sequence which was optimized, as was a lamination procedure Insulator tapes and edge seal material were identified and tested. Encapsulation materials were

N82-13501*# Spectrolab, Inc., Sylmar, Calif HIGH RESOLUTION, LOW COST SOLAR CELL CONTACT **DEVELOPMENT Final Report**

N Mardesich [1981] 82 p Sponsored in part by DOE Prepared for JPL, Pasadena, Calif (Contract JPL-955725)

(NASA-CR-165032, JPL-9950-611, DOE/JPL-955725-81/1)

Avail NTIS HC A05/MF A01 CSCL 10A The MIDFILM cell fabrication and encapsulation processes

were demonstrated as a means of applying low-cost solar cell collector metallization. The average cell efficiency of 12.0 percent (AM1, 28 C) was achieved with fritted silver metallization with a demonstration run of 500 starting wafers A 98 percent mechanical yield and 80 percent electrical yield were achieved through the MIDFILM process. High series resistance was responsible for over 90 percent of the electrical failures and was the major factor causing the low average cell efficiency Environmental evaluations suggest that the MIDFILM cells do not degrade A slight degradation in power was experienced in the MIDFILM minimodules when the AMP Solarlok connector delaminated during the environmental testing

N82-13514# Solarex Corp., Rockville, Md SILICON SOLAR CELL OPTIMIZATION Final Report, 15 Aug. 1978 - 15 Feb. 1981

Alan L Scheinine, John H Wohlgemuth, and Eileen Sparks Wright-Patterson AFB, Ohio AFWAL Jun 1981 99 p refs (Contract F33615-78-C-2039, AF Proj 3145) (AD-A106005, AFWAL-TR-81-2052) HC A05/MF A01 CSCL 10/2

This research program has resulted in improvements in vertical junction solar cell techniques leading to higher efficiencies and improved handleability. Vertical junction solar cells have now been fabricated with AMO conversion efficiency greater than 15% (25 C) A variety of cells have been fabricated including different groove depths, substrate thicknesses and bulk resistivities Cell performance has been measured both before and after irradiation. Theoretical analyses has been performed to generate computer models of I-V curves for various cell geometries

Author (GRA)

N82-13528# Midwest Research Inst., Golden, Colo **Energy Research Inst**

INEXPENSIVE THERMOGRAPHIC TECHNIQUES FOR DETERMINING RELIABLE SOLAR-COLLECTOR-ARRAY PERFORMANCE

A Eden and T Haverty Sep 1981 35 p refs (Contracts DE-AC02-77CH-00178, EG-77-C-01-4042) (DE82-001151, SERI/TR-721-1161) NTIS Avail HC A03/MF A01

Thermographic equipment, capable of detecting flow blockages, flow imbalances, and total array shutdown in residential and commercial solar energy collector systems is investigated The abilities of inexpensive thermographic equipment to perform solar array examinations in the field environment are described It was found that less expensive instruments, in combinations to enhance the capabilities of each general type, can be used to examine solar collector arrays. Expert infrared equipment operators are not required to obtain some conclusions on system problems A combination of pot radiation thermometers with either a hand-held imager or thermoprofile instrument is a viable inspection tool. Assessment of reliable flow control components, blocked collectors, unbalanced flow distribution, and reversed flow can all be observed with the combination of instruments

N82-13530# Sandia Labs , Livermore, Catif SOLAR-CENTRAL-RECEIVER FUELS AND CHEMICALS Project Status Report, Oct. 1980 - Jun. 1981

R W Carling, J D Fish, L. G Radosevich, and J Vitko, Jr Aug 1981 22 p refs (Contract DE-AC04-76DP-00789)

SAND-81-8232) (DE82-000941.

HC A02/MF A01

NTIS

Solar central receiver fuels and chemicals processes were studied Ethane pyrolysis and steam reforming or methane were investigated in-depth in addition to coal gasification, oil shale retorting, and biomass flash pyrolysis. The study criteria, status of ongoing work, and future activities are described

N82-13531# Midwest Research Inst. Golden, Colo Solar Energy Research Inst

SOLAR THERMAL ENERGY SYSTEMS Annual Technical Progress Report

Jul 1981 157 p refs

(Contracts DE-AC02-77CH-00178, EG-77-C-01-1012)

(DE81-029295. DOE/CS-4042/2) NTIS

NTIS

HC A08/MF A01

Technical progress in the solar thermal energy systems program is summarized Each project description includes a brief history, significant achievements, future activities, and a forecast of anticipated achievements. Point focus, central receiver and line focus technologies, research and advanced development components, materials, fuels and chemicals, and solar ponds are

N82-13532# Sandia Labs, Albuquerque, N Mex INTERMEDIATE PHOTOVOLTAIC SYSTEM APPLICATION EXPERIMENT OPERATIONAL PERFORMANCE REPORT.
VOLUME 2 FOR BEVERLY HIGH SCHOOL, BEVERLY, MASS.

Sep 1981 21 p Prepared in cooperation with Boeing Computer Services Co., Seattle, Wash (Contract DE-AC04-76DP-00789)

(DE82-000811. SAND-81-7088-2) NTIS

HC A02/MF A01

Performance data were listed and graphed for an intermediate photovoltaic system at a high school in Massachusetts for the month of July 1981. The energy production, incident solar energy and efficiency are given, and the daily energy production and efficiency, and energy production as a function of power and voltage are graphed. The output of the power conditioner, insolation, heating and cooling loads, temperature and wind data, and the number of freeze thaw cycles are presented

N82-13533# Lincoln Lab, Mass Inst of Tech, Lexington DATA REPORT FOR THE NORTHEAST RESIDENTIAL **EXPERIMENT STATION, JUNE 1981**

M C Russell, P Raghuraman, and J J Farrell Aug 1981 14 p

(Contract DE-AC02-76ET-20279)

DOE/ET-20279/154) (DE82-000068. Avail

HC A02/MF A01

Five prototype residential photovoltaic systems consisting of a roof-mounted array, sized to meet at least 50 percent of the annual electrical demand of an energy-conserving house, and an enclosed structure to house the remainder of the photovoltaic equipment, test instrumentation, and work space are being monitored to provide authoritative and accurate information concerning system performance and the typical loads which they serve One month of physical data is presented for each system as well as an hour-by-hour tabulation for an average day of the month A common feature of all the systems is that excess solar-generated electric energy is fed back to the utility grid, thus eliminating the need for on-site storage

N82-13543# California Univ. Livermore Lawrence Livermore

DESIGN AND TEST OF TWO-STEP SOLAR OIL SHALE RETORT

D W Gregg, R W Taylor, W R Aiman, and R Ruiz 24 Sep 1981 35 p refs (Contract W-7405-eng-48)

(DE82-000964, UCID-19199) Avail NTIS HC A03/MF A01

A design of a two step solar retort, the logic for the design, and the results from a preliminary test of the design at the

White Sands Solar Furnace, New Mexico are presented Solar retorting of oil shale is a technically feasible process where focused solar energy can displace fossil energy in the production of liquid fuels. The predicted result is a 10 to 40% improvement in the exportable fuel (oil + gas) production per ton of raw shale Greater improvements are achieved with the lower grade shales where with nonsolar processes a larger fraction of the fuel content has to be used in the processing

N82-13548# Swedish Inst for Materials Testing, Boras foer Ytskydd och Korrosion

AGING AND CORROSION PROBLEMS WITH FLAT SOLAR ENERGY ABSORBERS. STUDY BASED UPON LITERATURE AND EXPERIMENT EXCHANGES [AALDRINGS-OCH KORROSIONS-PROBLEM HOS PLANA TERMISKA SOLF-AANGARE. EN STUDIE BASERAD PAA LITTERATUR OCH ERFARENHETSUTBYTE]

Hans Wennerholm and Knut-Olof Lagerkvist 1979 72 p refs In SWEDISH

(SP-RAPP-1979/4) Avail NTIS HC A04/MF A01

The construction and the causes of damage to solar energy absorbers are reviewed. Aging is due to ultraviolet radiation, temperature, humidity, oxygen, impurities in the air and other effects A literature review is given about the constituent parts The coverplate may be of glass, several types of plastics, fluoro-compounds, fiberglass, or silicones. For the absorbing surface, sintered chromium oxide, black nickel, black iron, copper oxide, manganese oxides, or selective coated alumimium are used. The insulation is often made of mineral wool or polyurethane resins. Inspection data are reported for nine solar flat-shaped energy absorbers. Most of them are used for the production of warm water and have been in use between three months and three years. Nearly all coverplates bore important deposits caused by condensation. Some of the nine aborbers show corrosion on the aborbing surface and/or on insulation

Author (ESA)

N82-13549# National Bureau of Standards, Washington, D C PASSIVE/HYBRID SOLAR COMPONENTS: AN APPROACH TO STANDARD THERMAL TEST METHODS

M E McCabe, W Ducas, M J Orloski, and K N Decorte Jul 1981 87 p refs Sponsored in part by DOE

(PB81-227886. NBSIR-81-2300) HC A05/MF A01 CSCL 14B

A survey of passive solar products currently available or under development enabled the development of an interim classification system consisting of ten component classifications for purposes of thermal testing A survey of currently available thermal test procedures was performed to assess the applicability of these test methods for passive/hybrid solar components Existing test procedures that are useful for the direct gain fenestration system classification are identified and recommendations are made for evaluation of these laboratory-based procedures by comparison with field-based testing of components under controlled interior conditions. Recommendations are also made for the development of new test procedures for passive/hybrid components classifications for which existing test methods are not applicable

N82-14384# New Hampshire Univ , Durham Dept of Chemical Engineering

FUELS AND CHEMICALS MADE FROM SOLAR ENERGY V K Mathur, F K Manasse, and S Lakshmanan 1981 10 p refs Presented at the 2nd World Congr of Chem Engr, Montreal, Canada, 4-9 Oct 1981

(Contract DE-AC02-79ET-21067)

(DE81-025018, CONF-811007-6)

NTIS Avail

HC A02/MF A01

The application of high temperature solar energy for the production of fuels and chemicals from various feed stocks is reviewed. The promises and problems of this technology are highlighted The two-stage Sun gas process is described The role of chemical engineers and the future of Sun fuels and chemicals are discussed

N82-14627*# DHR. Inc., Washington, D.C.
MARKET ASSESSMENT OF PHOTOVOLTAIC POWER SYSTEMS FOR AGRICULTURAL APPLICATIONS IN **MOROCCO** Final Report

Henry Steingass and Itil Asmon (ARD, Inc.) Sep. 1981 157 p.

(Contract DEN3-180, DE-AI01-79ET-20485) (NASA-CR-165477, DOE/NASA/0180-2, C4100-50) Avail NTIS HC A08/MF A01 CSCL 10A

Results of a month-long study in Morocco aimed at assessing the market potential for stand-alone photovoltaic systems in agriculture and rural service applications are presented. The following applications, requiring less than 15 kW of power, are described irrigation, cattle watering, refrigeration, crop processing, potable water and educational TV Telecommunications and transportation signalling applications, descriptions of power and energy use profiles, assessments of business environment. government and private sector attitudes towards photovoltaics. and financing were also considered. The Moroccan market presents both advantages and disadvantages for American PV manufacturers. The principle advantages of the Moroccan market are a limited grid, interest in and present use of PV in communications applications, attractive investment incentives, and a stated policy favoring American investment Disadvantages include lack of government incentives for PV use, general unfamiliarity with PV technology, high first cost of PV, a well-established market network for diesel generators, and difficulty with financing. The market for PV in Morocco (1981-1986), will be relatively small, about 340 kwp. The market for PV is likely to be more favorable in telecommunications, transport signalling and some rural services The primary market appears to be in the public (i.e., government) rather than private sector, due to financial constraints and the high price of PV relative to conventional power sector MDK

N82-14630* # Ross (Bernd) Associates, San Diego, Calif DEVELOPMENT OF AN ALL-METAL THICK FILM COST EFFECTIVE METALLIZATION SYSTEM FOR SOLAR CELLS Quarterly Report, Nov. 1980 - Apr. 1981 Bernd Ross Sep 1981 40 p refs

(Contract JPL-955688)

(NASA-CR-165043, DOE/JPL-955688-80/3, JPL-9950-604, QR-3) Avail NTIS HC A03/MF A01 CSCL 10A

The objectives of the investigation were to provide all-metal screenable pastes using economical base metals, suitable for application to low-to-high conductivity silicon of either conductivity type and possibly to aluminum surfaces. Experiments were conducted with variations in paste parameters, firing conditions, including gas ambients, furnace furniture, silicon surface and others A liquid medium, intended to provide transport during the carbon fluoride decomposition was incorporated in the paste with promising results

N82-14631*# Solarelectronics, Inc., Bellingham, Mass FLAT-PLATE SOLAR ARRAY PROJECT. TASK 1: SILICON MATERIAL: INVESTIGATION OF THE HYDROCHLORINA-TION OF SiC1SUB4 Quarterly Report, 9 Jul. - 30 Sep. 1981

Jeffrey Y P Mui 1 Oct 1981 17 p refs (Contract JPL-956061)

(NASA-CR-165042, DOE/JPL-956061/1, JPL-9950-607) Avail NTIS HC A02/MF A01 CSCL 10A

A two inch-diameter stainless steel reactor was designed to operate at pressure up to 500 psig and at temperature up to 600 C in order to study the hydrochlorination of silicon tetrachloride and metallurgical grade (mg), silicon metal to trichlorosilane. The hydrochlorination apparatus is described and operation safety and pollution control are discussed

N82-14634*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala

SATELLITÉ POWER SYSTEM: CONCEPT DEVELOPMENT AND EVALUATION PROGRAM. VOLUME 4: ENERGY CONVERSION AND POWER MANAGEMENT

Nov 1981 369 p refs (NASA-TM-58237-Vol-4) Avail NTIS HC A16/MF A01 CSCL 10A

Additional analyses that were performed to supplement the NASA/Department of Energy (DOE) Satellite Power System (SPS) reference system concept are presented in this volume. A brief review of the reference concept is provided together with detailed descriptions of energy conversion, power distribution, and power management for solar photovoltaics (silicon and gallium arsenide), solar thermal (Brayton and Rankine cycles), and concept comparisons (solar thermal and energy conversion) Results of other studies concerning energy conversion and power management (environmental impacts, annealing, nuclear SPS concept, and thermionic) are included. The data presented were taken from the SPS Concept Definition Studies performed under the direction of NASA by Rockwell International Corporation and Boeing Aerospace Company

N82-14635*# National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala SATELLITE POWER SYSTEM: CONCEPT DEVELOPMENT AND EVALUATION PROGRAM. VOLUME 7: TRANSPORTATION

Nov 1981 258 p refs

(NASA-TM-58238-Vol-7) Avail NTIS HC A12/MF A01 CSCL

During the several phases of the Satellite Power System (SPS) Concept Definition Study, various transportation system elements were synthesized and evaluated on the basis of their potential to satisfy overall SPS transportation requirements and their sensitivities, interfaces, and impact on the SPS Additional analyses and investigations were conducted to further define transportation system concepts that will be needed for the developmental and operational phases of an SPS program To accomplish these objectives, transportation systems such as the Shuttle and its derivatives have been identified, new heavy-lift launch vehicle (HLLV) concepts, cargo and personnel orbital transfer vehicles (COTV and POTV), and intra-orbit transfer vehicle (IOTV) concepts have been evaluated, and, to a limited degree, the program implications of their operations and costs were assessed The results of these analyses have been integrated into other elements of the overall SPS concept definition studies

N82-14636*# General Dynamics/Convair, San Diego, Calif STUDY OF MULTI-MEGAWATT TECHNOLOGY NEEDS FOR PHOTOVOLTAIC SPACE POWER SYSTEMS. VOLUME 1: **EXECUTIVE SUMMARY**

D M Peterson and R L Pleasant 1 Aug 1981 28 p refs 2 Vol

(Contract NAS3-21951)

(NASA-CR-165323-Vol-1, Rept-111-2401-204) Avail NTIS HC A03/MF A01 CSCL 10A

Possible missions requiring multimegawatt photovoltaic space power systems in the 1990's time frame and associated power system technology needs are examined. The following concepts for photovoltaic power approaches are considered planar arrays. concentrating arrays, hybrid systems using Rankine engines. thermophotovoltaic and AC/DC power management approaches, battery, fuel cell, flywheel energy storage, and interactions with the electrical ion engine injection and stationkeeping system The levels of modularity for efficient, safe, constructable, serviceable, and cost effective system design are analyzed, and the benefits of alternate approaches developed Both manned low Earth orbit and unmanned geosynchronous Earth orbit applications were examined for technological development Technology developments applicable to power systems which appear to have benefits independent of the absolute power level are suggested MDK

N82-14637*# General Dynamics/Convair, San Diego, Calif STUDY OF MULTI-MEGAWATT TECHNOLOGY NEEDS FOR PHOTOVOLTAIC SPACE POWER SYSTEMS, VOLUME 2 Final Report

D M Peterson and R L Pleasant 19 Mar 1981 285 p refs 2 Vol

(Contract NAS3-21951)

(NASA-CR-165323-Vol-2, GDC-AST-81-019-Vol-2) Avail NTIS HC A13/MF A01 CSCL 10A

Possible missions requiring multimegawatt photovoltaic space nower systems in the 1990's time frame and power system technology needs assuciated with mese missions are examined Four specific task areas were considered (1) missions requiring power in the 1-10 megawatt average power region, (2) alternative power systems and component technologies. (3) technology goals and sensitivity trades and analyses, and (4) technology recommendations Specific concepts for photovoltaic power approaches considered were planar arrays, concentrating arrays, hybrid systems using Rankine engines, thermophotovoltaic approaches. all with various photovoltaic cell component technologies. Various AC/DC power management approaches, and battery, fuel cell, and flywheel energy storage concepts are evaluated Interactions with the electrical ion engine injection and stationkeeping system are also considered MDK

N82-14643# Arabian Exhibition Management Ltd , Manama (Bahrain)

SOLTECH 80

1980 174 p Conf held at Bahrain, 10-11 Nov 1980 (DE81-901931, CONF-801178) Avail NTIS (US Sales Only) HC A08/MF A01, DOE Depository Libraries

Three solar related activities solar radiation monitoring, effects of dust accumulation on collector performance, and salt gradient solar pond analytical and experimental studies are described Measurements of total horizontal and direct radiation are made continuously, and the data are presented in a user oriented format on an hourly basis Diffuse radiation and total radiation on a surface tilted to the local latitude angle are calculated The system is presently being expanded to allow measurement of several additional radiation parameters of interest as well as six meteorological parameters. The effects of atmospheric dust on radiation attenuation, as well as the clearness index, anti K/sub T/ are shown. The impact of surface dust accumulation on the performance of photovoltaic and thermal collectors is also studied.

N82-14656# Lincoln Lab, Mass Inst. of Tech., Lexington PHOTOVOLTAIC SYSTEMS PERFORMANCE EXPERIENCE F J Solman 1981 8 p refs Presented at IEEE Photovoltaic Specialists Conf., Orlando, Fla., 11-15 May 1981 (Contract DE-AC02-76ET-20279)

(DE81-025725; DOE/ET-20279/147, CONF-810526-39) Avail NTIS HC A02/MF A01

The photovoltaic power systems at Natural Bridges National Monument in southeastern Utah and at radio station WBNO in Bryan. Ohio, provided reliability experience and case histories on failures and repairs of large photovoltaic systems. The PV systems are used for illustration of potential sources of system outages and measures that can be taken to improve the reliability and repair economy of present and future PV systems. Both systems, have experienced lighting strikes, and the results are reported.

N82-14657# Lincoln Lab, Mass Inst of Tech, Lexington SOLAR PHOTOVOLTAIC RESIDENTIAL PROJECT. PROJECT INTEGRATION MEETING, AGENDA AND ABSTRACTS

1981 63 p refs Presented at Solar Photovoltaic Residential Project Integration Meeting, Cambridge, Mass. 24-25 Jun 1981

(Contract DE-ACO2-76ET-20279)

(DE81-028433, DOE/ET-20279/150, CONF-8106143) Avail NTIS

Thirty three abstracts are presented covering residential photovoltaic design, economics and requirements, balance of system components, PV/thermal collectors, PV interfaced with passive solar design, and utilities related aspects

N82-14658# Midwest Research Inst. Golden. Colo SYSTEMS ANALYSIS OF THERMAL STORAGE

R J Copeland Aug 1981 8 p refs Presented at the Ann Meeting on Thermal and Chem Storage, Tysons Corner, Va., 14-16 Sep 1981

(Contracts DE-AC02-77CH-00178; EG-77-C-01-4042)

(DE81-030288, SERI/TP-253-1369, CONF-81940-2) Avail NTIS HC A02/MF A01

Analyses were conducted on thermal storage concepts for solar thermal applications. These studies include estimates of both the obtainable costs of thermal storage concepts and their worth to a user (i.e., value). Based on obtainable costs and performance, an in-depth study evaluated thermal storage concepts for water/steam, organic fluid, and gas/Brayton solar thermal receivers. Promising and nonpromising concepts were identified. Thermal storage concepts were evaluated for a liquid metal receiver. The value of thermal storage in a solar thermal industrial process heat application was analyzed. Several advanced concepts studied, include ground-mounted thermal storage for parabolic dishes with Stirling engines.

N82-14661# Mid-American Solar Energy Complex, Minneapolis,

SEMINARS FOR PRIVATE COLLEGE ADMINISTRATORS ON SOLAR APPLICATIONS FOR COLLEGE BUILDINGS

Jun. 1981 8 p (Contract DE-AC02-79CS-30150) (DE81-027981. MASEC-CF-81-038)

Avail: NTIS

HC A02/MF A01

The objective of this project was to increase the working knowledge of key private college decision makers on passive and active solar fundamentals, proven passive and active technology, and conservation means integral to these technologies in the renovation of college buildings or their energy systems, to be achieved by conducting a series of three seminars A summary of the project activities and a brief summary of workshop evaluations are given

N82-14665# Colorado State Univ , Fort Collins Solar Energy Applications Lab

REPEAT FACILITY. REPORT FOR MAY, JUNE, JULY Progress Report, May - Jul. 1981

Progress Report, May - Jul. 1981 C Byron Winn Aug 1981 79 p refs (Contract DE-AS02-80CS-30259) (DE81-028156; DOE/CS-30259/6)

Avail NTIS

HC A05/MF A01

The construction of the REPEAT facility, a test facility for passive and hybrid solar heating systems is reported. The development of a simulation program for envelope type passive solar systems, constructing an envelope test cell, collecting data to validate the program, and application of the program to determine the best envelope type design are discussed. A low cost monitoring system using a dedicated microprocessor system, an inexpensive, high accuracy A/D converter, and minimum system hardware is developed. A method to determine the average temperature and the average daily temperature variation inside a passively heated solar building is presented.

N82-14668# Department of Agriculture, Washington, D C National Economics Div

SOLAR-SUPPLEMENTED, NATURAL AIR DRYING OF SHELLED CORN: THE ECONOMIC LIMITATIONS

Walter G Heid, Jr and David F Aldis Jun 1981 45 p refs (PB81-235681, TB-1654) Avail NTIS HC A03/MF A01 CSCL 02C

It is not economically feasible to supplement natural air drying of high-moisture shelled corn by adding heat (solar and otherwise) In some cases, that drying method speeds product deterioration A simulation analysis of the west central Great Plains determined that benefits from adding solar heat to batch-in-bin and layer-in-bin grain drying methods failed to offset the solar heat installation costs and product deterioration losses. Findings also suggest that high-speed, high-temperature drying is necessary to avoid field losses and to ensure marketable corn of high quality. GRA

N82-15247# Argonne National Lab., III
PERFORMANCE PREDICTIONS OF PASSIVE SOLAR
COMMERCIAL BUILDINGS

T L Kurbowski 1981 5 p refs Presented at 2nd Natl Tech Conf on Earth Sheltered Buildings, Tulsa, Okla , 16 Oct 1981 (Contract W-31-109-eng-38) (DE81-027979, CONF-811034-1) Avail. NTIS HC A02/MF A01

Many Earth bermed and high mass commercial structures tending to require cooling and lighting rather than heating were designed, built, and instrumented to record segregated or partitioned energy usage Design solutions, preliminary performance, and cost information are addressed for the earth integrated projects

N82-15526*# Vanderbilt Univ , Nashville, Tenn Dept. of Physics and Astronomy

ADVANCED SOLAR ENERGY CONVERSION Annual Progress Report, 1 Sep. 1980 - 31 Aug. 1981

Ja H Lee 31 Aug 1981 22 p refs

(Contract NCC1-8)

(NASA-CR-165060) Avail NTIS HC A02/MF A01 CSCL 10A

An atomic iodine laser, a candidate for the direct solar pumped lasers, was successfully excited with a 4 kW beam from a xenon arc solar simulator, thus proving the feasibility of the concept. The experimental set up and the laser output as functions of operating conditions are presented. The preliminary results of the iodine laser amplifier pumped with the HCP array to which a Q switch for giant pulse production was coupled are included. Two invention disclosures - a laser driven magnetohydrodynamic generator for conversion of laser energy to electricity and solar pumped gas lasers - are also included.

N82-15529# Varta Batterie A.G., Kelkheim (West Germany) Forschungs- und Entwicklungszentrum

ENERGY STORAGE SYSTEMS FOR TERRESTRIAL SOLAR GENERATORS Final Report, Dec. 1980

Margarete Jung Bonn Bundesministerium fuer Forschung und Technologie May 1981 76 p refs in GERMANY; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-81-082, ISSN-0340-7608) NTIS Avail HC A05/MF A01, Fachinformationszentrum, Karlruhe, West

Germany DM 16

Mercury can react with Raney nickel to form the alloy NiHg4 This intermetallic compound is the basis of an excellently rechargeable positive electrode material in combination with cadmium it forms a rechargeable cadmium/mercury oxide cell which can be operated under hermetically sealed conditions. Since both electrodes are thermodynamically stable in aqueous alkaline electrolytes, the self discharge rate of the cell is very low and hence the Coulomb efficiency even at very low charge rates in the order of 1000 - 2000 hrs is higher than 95%. The cadmium/mercury oxide cells can be cycled more than a hundred times. These cells are particularly qualified to serve as an energy storage in combination with photovoltaic cells

N82-15530# Internationale Atomreaktorbau Gesellschaft. Bensberg (West Germany) Abt Anlagenbau

GAS COOLED SOLAR POWER PLANT FOR GENERATING ELECTRICAL ENERGY IN THE 20MWe OPERATING RANGE (GAST): PRELIMINARY DESIGN PHASE Final Report,

Siegfried Kostrzewa and Peter Wehowsky Bonn Bundesministerium fuer Forschung und Technologie Jul 1981 33 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-81-097, ISSN-0340-7608, IAT-BS-100000-010) Avail NTIS HC A03/MF A01, Fachinformationszentrum,
Karlsruhe, West Germany DM 7

R&D work required for the erection of a pilot plant was defined Since the location of the site is not yet determined, the project work was based on preliminary basic data. Significant results of the preliminary design phase include both the choice of a combined gas/steam thermal energy conversion process for the reference concept and basic concepts for heliostat, heliostat field arrangement, receiver, tower and master control/process computer system

N82-15532# Dornier-Werke G m b H , Friedrichshafen (West Germany) New Energy Technology DEVELOPMENT OF A PROTOTYPE OF A 10 kW SMALL

SOLAR POWER PLANT Final Report, Sep. 1979 Franz Maier and Josef Haenfling Bonn Bundesministerium füer Forschung und Technologie Jun 1981 170 p ref In GERMAN. ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-81-101, ISSN-0340-7608) Avail NTIS HC A08/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 33,50

Activities performed in the design and construction of a solar driven 10 kW turbogenerator for local TV-educational systems, irrigation pumps and other applications in developing countries include (1) System design and thermodynamic calculation, (2) Design of the collector array and construction (3) Fixing of components and auxiliary units. (4) Turbine design, construction, manufacture and test run. (5) Generator design. construction, manufacture and test run, (6) Turbogenerator integration and test, (7) Electrical supply, plant control and regulation, and (8) Test assembly, performance and analysis Component tests are being run and are being evaluated by a data acquisition unit installed on site ARH

N82-15534# Prins Maurits Lab TNO, Rijswijk (Netherlands) Inst voor Chemische en Technologische Research

SOLAR POWER SYSTEMS SMALLER THAN 500 W FOR MILITARY USE

P P M M Wittgen Nov 1979 27 p refs In DUTCH. **ENGLISH** summary

(Contract A78/KL/125)

(PML-1980-06, TDCK-73397) Avail NTIS HC A03/MF A01 A literature search of the feasibility of using photovoltaic cells for the energy supply of low power-consuming military equipment is presented. Progress in the technology of solar cells

in the coming years offers good prospects for the use of photovoltaic systems. A hybrid system consisting of an array of solar cells combined with secondary batteries in a sunny climate is capable of supplying equipment with energy. Climatic conditions in the Netherlands and the northern part of Germany are too bad for a fully self-supporting year round system Especially in winter the intensity and quantity of the radiation is too low In these northern regions the hybrid solar system can only be used when additional primary or secondary batteries are J D H accepted in the winter period

Messerschmitt-Boelkow-Blohm G m b H , Ottobrunn (West Germany). Unternehmensbereich Raumfahrt ORGANIC FLUIDS FOR THE PRACTICAL USE IN ENERGY CONVERSION SYSTEMS OF SOLAR POWER PLANTS Final Report, Jun. 1980

Guenther Schmidt, Dietmar Wolf, and Eberhard Raasch Bundesministerium fuer Forschung und Technologie Sep 1981 76 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-81-154, ISSN-0340-7608) Avail. NTIS

HC A05/MF A01

With respect to their specific performance, the most promising organic fluids were determined for their practical use in Rankine cycles operating in the temperature range between 150 and 400 C For these fluids, the process cycle efficiencies were compared for different temperature levels. Laboratory experiments with a great number of fluids and lubricants results in the estimation of the operation limit in Rankine Cycles A test facility consisting of a heating system, an organic Rankine cycle and a control and measurement system was designed, built, and put into operation for testing various working fluids. Author

N82-15538# Dornier-Werke GmbH, Friedrichshafen (West Germany)

HIGH EFFICIENT COLLECTOR FOR SMALL SOLAR-POWERED FACILITIES Final Report

Eugen Obermayr, Wolfgang Molt, Dieter Schneller, and Klaus Speidel Bonn Bundesministerium fuer Forschung und Technologie Sep 1981 100 p In GERMAN; ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie (BMFT-FB-T-81-156. ISSN-0340-7608) Avail Avail

HC A05/MF A01, Fachinformationszentrum, Karlsruhe, West

Germany DM 21

A series of preliminary investigations and laboratory, tests were performed as a basis for developing a new type of solar collector. The vacuum flat plate collectors are actually evaporators. where the working medium is evaporated within the collector itself Prototypes of direct evaporation collectors were constructed and tested in the temperature range seen for this application (130 - 150 C), the collector efficiency is about 40 - 50 percent

N82-15541# Messerschmitt-Boelkow-Blohm G m b H , Ottobrunn (West Germany) Space Div
COMPARISON OF CONCEPTS FOR SOLAR-HEATED OR

SOLAR-DRIVEN ABSORPTION AND COMPRESSION **COOLING MACHINES FOR AIR CONDITIONING AND FOOD** PRESERVATION PURPOSES, PHASE 1 Final Report, Nov.

Herbert Grallert, Manfred Herbricht, and Martin Margulies Bonn Bundesministerium fuer Forschung und Technologie Sep 1981 91 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie (BMFT-FB-T-81-165, ISSN-0340-7608) Avail

HC A05/MF A01, Fachinformationszentrum, Karlsruhe, West

Germany DM 19,10

For the cooling power range of about 10 to 500 kW and for cooling temperatures of +20, 0, and -20 C, a comparison was made between solar heated absorption machines and compression machines, which are driven by a solar heated Rankine cycle Comparison criteria are C O P, energy prices, and application risks All partial efficiencies and costs were determinated by component analyses For several cooling loads an annual system simulation was performed using MBB computer programs Furthermore, the electric energy demand for absorption cooling systems was estimated and initial application recommendations are given Author

N82-15544# Midwest Research Inst., Golden, Colo Energy Research Inst.

LOW-COST PASSIVE-SOLAR RETROFITS FOR NEW AND EXISTING MOBILE HOMES

Steve Brant and Michael Holtz Jul 1981 6 p refs Presented at the 6th AS/ISES Natl Passive Conf , Portland, Oreg , 8-12 Sep

(Contracts DE-AC02-77CH-00178, EG-77-C-01-4042) (DE81-028356, SERI/TP-721-1138R, CONF-810925-17) Avail

NTIS HC A02/MF A01

Passive solar heating and cooling retrofit options can significantly reduce the energy consumption of new and existing mobile homes. The initial efforts of the Solar Energy Research Institute to explore the solar potential for the existing stock of mobile homes and those in the production stage are described

N82-15545# Midwest Research Inst , Golden, Colo INDUSTRIAL PROCESS HEAT APPLICATIONS FOR SOLAR THERMAL TECHNOLOGIES

David Feasby and David W Kearney Jun 1981 9 p refs Presented at the 3rd Intern Conf on Energy Use Management, West Berlin, 26 Oct 1981

(Contract DE-AC02-77CH-00178)

(DE81-025934, SERI/TP-733-1278, CONF-811006-2) Avail

NTIS HC A02/MF A01

Selected solar industrial process heat (IPH) activities under development in the US are reviewed. Included are a summary of the IPH field test program, status of solar thermal technologies, and results of specific technology/application matching and market studies. The near term viability of solar technologies in the industrial sector is dependent upon both the economic and technical issues which vary depending on the application, plant site, and system selected

N82-15551# Monsanto Research Corp., Dayton, Ohio LOW-COST MIRROR CONCENTRATOR BASED ON INFLATED, DOUBLE-WALLED, METALLIZED, TUBULAR FILMS Final Report

J L Schwendeman, G L Ball, III, J W Leffingwell, and C E McClung Jul 1981 121 p $^{\rm l}{\rm refs}$

(Contract DE-AC04-78AL-04227)

(DE81-027813, MRC-DA-944, ALO-4227-6) Avail NTIS HC A06/MF A01

A potentially low cost, inflatable plastic solar mirror concentrator based on segments of a cylinder joined along the length of the collector on a plane passing through the axis of the absorber tube was designed and built. This design results in a savings of approximately 40% in the amount of window and mirror material and in a savings of about 20% of the land area occupied by a single collector when compared to a fully cylindrical one. The type of construction permits the assembling of the mirror/window envelope to the collector without disturbing the collector frame, absorber tube, or the associated plumbing Aluminum foil plastic laminates were used as an alternative to aluminized polyester films, because of their potential low cost and durability. Specially ultraviolet stabilized and polyester scrim reinforced flexible polyvinyl chloride film was developed for use as the outer cover material DOF

N82-15563# Mid-American Solar Energy Complex, Minneapolis,

SOLAR ENERGY TRAINING PROGRAM FOR CODE **ENFORCEMENT PERSONNEL**

Jun. 1981 17 p

(Contract DE-AC02-79CS-30150)

(DE81-030053; MASEC-CF-81-023, P-101-12/A-101-4) Avail

NTIS HC A02/MF A01

A training program for building code officials is discussed The development of a new model building code for solar was coordinated and course materials was developed A manual to inform code officials about the basics of passive and active solar energy and the model code is developed Michigan was selected as the target state

N82-15564# Mid-American Solar Energy Complex, Minneapolis.

SUMMARY OF PASSIVE SOLAR MULTI-FAMILY DESIGN WORKSHOPS

Jun 1981 14 p

(Contract DE-AC02-79CS-30150)

(DE81-030353, MASEC-CF-81-035; P-103-4) Avail. NTIS

HC A02/MF A01

Instructional materials on the design, construction, and marketing of passive solar multi-family residential buildings were developed. An outline of the workbook used for the workshops is presented, along with a list of the workshops. Promotional activities are described briefly

N82-15569# Midwest Research Inst., Golden, Colo Photoconversion Research Branch

PHOTOELECTROCHEMICAL SOLAR CELLS: STABILIZA-TION OF SMALL-BAND-GAP SEMICONDUCTOR IN AQUEOUS SOLUTION BY SURFACE-ATTACHED ORGANIC CONDUCTING POLYMER

Arthur J Frank Sep 1981 13 p refs Presented at the Intern Conf on Low-Dimensional Conductors, Boulder, Colo. 10-14 Aug 1981

(Contracts DE-AC02-77CH-00178, EG-77-C-01-4042)

(DE81-030312, SERI/TP-233-1388, CONF-810864-1) NTIS HC A02/MF A01

Surface-attached polypyrrole films are shown to produce a marked improvement in the stability of n-type single-crystal and polycrystalline Si against oxidation in an aqueous electrolyte The current production of n-type polycrystalline Si coated with polypyrrole deteriorates less than 30% during 122 hr of irradiation whereas the unprotected bare electrode stops producing photocurrent within 30 s. The polymer protection of the n-type single-crystal Si is significantly less than that of the polycrystalline material because of differences in the adhesion of the polymer film to the electrode surfaces. The adhesion strength is shown to depend on various surface properties of Si and other electrode materials. Moreover, the surface morphology of the electrode affects the topography of the growing surface of the polypyrrole film Requirements are discussed for the applications of organic conducting polymers to photoelectrochemical devices utilized for solar energy conversion

N82-15571# Brookhaven National Lab , Upton, N Y of Energy and Environment

COMPARATIVE THERMAL PERFORMANCE OF DIRECT GAIN, TROMBE, AND SUNSPACE WALLS

H T Ghaffarı and R F Jones 1981 8 p refs Presented at the 6th Natl Passive Conf. Portland, Ore, 8-12 Sep 1981 sap (Contract DE-AC02-76CH-00016)

(DE81-030546, BNL-29970, CONF-810925-21) Avail NTIS HC A02/MF A01

The natural thermal storage features of the Brookhaven superinsulated house were analyzed and verified. These include the Trombe and sunspace passive-solar-collection walls and the superinsulated south-facing wall. The thermal contributions of each system were demonstrated. Several thermal characteristic factors, in relation to each design for the hourly and daily period, were assessed Further, the interior temperature fluctuations and the reductions in the required auxiliary energy with regard to incorporated passive designs were evaluated

N82-15572# Department of Energy, Washington, D C Office of the Assistant Secretary for Conservation and Renewable Energy

ANNUAL DOE ACTIVE SOLAR HEATING AND COOLING CONTRACTORS REVIEW MEETING

Sep 1981 286 p refs Proc of Conf held in Washington, D.C., Sep 1981

(DE81-028052,

CONF-810912) HC A13/MF A01

Avail NTIS

Ninety three project summaries dicussing the following aspects of active solar heating and cooling are presented. Rankine solar cooling systems, absorption solar cooling systems, desiccant solar cooling systems, solar heat pump systems, solar hot water systems, special projects (such as the National Solar Data Network, hybrid solar thermal/photovoltaic applications, and heat transfer and water migration in soils), administrative/ management support, and solar collector, storage, controls, analysis, and materials technology

N82-15575# California Univ. Berkeley Lawrence Berkeley INCREMENTAL COOLING LOAD DETERMINATION FOR

02 SOLAR ENERGY

PASSIVE DIRECT GAIN HEATING SYSTEMS

Paul W. Sullivan, Douglas Mahone, Winslow Fuller, James Gruber, Ron Kammerud, Wayne Place, and Brandt Anderson May 1981 5 p refs Presented at the Am Sect. of the Intern Solar Energy Soc , Philadelphia, 27-30 May 1981

(Contract W-7405-eng-48)

(DE81-029882; LBL-12048, CONF-810509-40) Avail NTIS HC A02/MF A01

The applicability of the National Association of Home Builders (NAHB) full load compressor hour method for predicting the cooling load increase in a residence attributable to direct gain passive heating systems is examined. The NAHB method predictions are compared with the results of 200 hour-by-hour simulations using BLAST, and the two methods show reasonable agreement. The degree of agreement and the limitations of the NAHB method are discussed

N82-15576# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.

SERI SOLAR-ENERGY-STORAGE PROGRAM

Charles E Wyman Aug 1981 3 p refs Presented at the Ann. DOE Active Solar Heating and Cooling Contractors Rev Meeting, Washington, D.C., 14-16 Sep. 1981 (Contracts DE-AC02-77CH-00178, EG-77-C-01-4042) (DE81-029476; SERI/TP-620-1344; CONF-810912-11) Avail

NTIS HC A02/MF Á01

The program provides research, system analysis, and assessments of thermal energy storage and transport in support of the Thermal Energy Storage Program of the DOE Division of Energy Storage Technology; emphasis is on thermal energy storage for solar thermal power and process heat applications and on thermal energy transport Currently, research is in progress on direct-contact thermal energy storage and thermochemical energy storage and transport. In addition, SERI is directing the definition of new concepts for thermal energy storage and supporting research on thermal energy transport by sensible and latent heat media SERI is performing systems analyses of thermal energy storage for solar thermal application and coordinating thermal energy storage activities for solar applications DOE

N82-15577# California Univ. Berkeley Lawrence Berkeley Energy and Environment Div

OVERVIEW OF ACTIVE SOLAR ABSORPTION/RANKINE COOLING PROGRAM

Michael Wahlig, Al Heitz, Harry Angerman, Ron Glas, and Mashuri Warren Jul 1981 7 p Presented at the Active solar Contractors' Review Meeting, Washington, D.C. 9-12 Sep. 1981, sponsored

(Contract W-7405-eng-48)

(DE81-028041; LBL-13054-Rev. CONF-810912-13) Avail NTIS HC A02/MF A01

The individual absorption and Rankine projects along with the main features and accomplishments/status of each and future plans were identified. The absorption program, was three active component development projects, four systems field test projects, one advanced fluid study project and one advanced cycle study project Rankine program, includes five active component development projects, two system field test projects, and one advanced study project

N82-15578# California Univ., Berkeley Lawrence Berkeley Energy and Environment Div

VERIFICATION OF BLAST BY COMPARISON WITH MEASUREMENTS OF A SOLAR-DOMINATED TEST CELL AND A THERMALLY MASSIVE BUILDING

Brandt Andersson, Fred Bauman, William Carroll, Ronald Kammerud, and Nina Friedman Apr. 1981 12 p refs Presented at the 3rd Ann, Systems Simulation and Econ Anal Operational Results Conf., Solar Energy Div., Reno, Nev., 27 Apr. - 1 May 1981, sponsored by ASME

(Contract W-7405-eng-48)

(DE81-029883, LBL-11387, CONF-810405-16) Avail NTIS HC A02/MF A01

Temperatures were compared in a direct solar gain test cell and temperatures were predicted. The compansons were performed for two distinct climate period. The test cell configuration and weather data manipulations, quantitative evaluations of the comparisons between measured and predicted interior temperatures, limitations of the comparisons, and sensitivities of the simulation results to uncertainties in the measured parameters are examined in the second study, comparisons of BLAST predictions to temperatures and loads measured in a massive structure were carried out. The tests verifying the program's ability to (1) calculate full scale building loads, and (2) accurately model hybrid cooling using forced ventilation

N82-15581# Los Alamos Scientific Lab , N Mex USE OF OXIDE DECOMPOSITIONS IN ADVANCED THERMOCHEMICAL HYDROGEN CYCLES FOR SOLAR HEAT SOURCES. APPLICATION OF THE TRICOBALT TETRAOXIDE-COBALT MONOXIDE PAIR

W M Jones and M G. Bowman 1981 9 p refs Presented at Intern Energy Agency Annex 1 Workshop on Thermochem Hydrogen, Julich, West Germany, 23 Sep 1981 (DE81-030235, LA-UR-81-2628, CONF-810942-6) Avail

NTIS HC A02/MF A01

The concept of utilizing oxide decompositions in advanced thermochemical hydrogen cycles for solar heat sources is introduced. It allows direct transmission of energy to the process through an air window Reaction (2) gives a high concentration of Mgl2 that would be favorable for (3) The solutions contain jodine dissolved as polyiodide, partly offsetting this advantage It is indicated that reaction (2) is slow at 150 C It is surmised that the mechanism of (2) consists of the iodine disproportionation reaction (6), followed by reaction (7) It was found that (6) was relatively fast and with a good yield at 150 C Reaction (7) is sufficiently slow at 150 C to account for the slowness of (2) The yield of (7) is proportional to the square root of the time. suggesting that iodate must diffuse through an adherent, accumulating CO3O4 layer

03 HYDROGEN

Includes hydrogen production, storage, and distribution

A82-10398 Hydrogen generation by means of catalyzed Mg-Al hydrolysis. K. Hohne and P. Jager (Siemens AG, Forschungslaboratorien, Erlangen, West Germany). Siemens Forschungs- und Entwicklungsberichte, vol. 10, no. 5, 1981, p. 323-326. 5 refs.

Based on considerations of reactivity, costs, and the volume of hydrogen which can be expected per mass fraction of metal, Al and Mg offer good possibilities in metal hydrolysis. Since these metals hardly react with water, however, a catalyst is used to accelerate the Mg-Al hydrolysis process. Experiments show that a mixture of Mg and Al reacts strongly with water in the presence of CO3O4, MoO3, and Cl-ions, with an optimum combination of all the participants in the reaction, the H2 yield can amount to 100% Various methods are discussed for constructing a hydrogen generator using this new method of metal hydrolysis. A hydrogen generator plant is described, in which pressed powder pellets are used. An aluminum-magnesium-cobalt oxide powder mixture is introduced into the reactor in the form of cylindrical pellets, which are pulverized in the reactor chamber. The powder falls into the salt water in the reactor and is converted. The hydrogen produced has a purity potentially greater than 99.9%.

J.F.

A82-10966 # A LH2 engine fuel system on board - Cold GH2 injection into two-stroke engine with LH2 pump S Furuhama (Musashi Institute of Technology, Tokyo, Japan), Y Kobayashi, and M Iida American Society of Mechanical Engineers and American Institute of Chemical Engineers, National Heat Transfer Conference, 20th, Milwaukee, WI, Aug 2-5, 1981, ASME Paper 81-HT-81 10 p 14 refs. Members, \$2 00, nonmembers, \$4 00

An LH2-tank with a range of 400 km was installed in the rear trunk of a small passenger car in June, 1980. Tests demonstrated the overall feasibility of a hydrogen-fueled car the tank attained a maximum power 20% to 20% higher than its gasoline counterpart and about twice as high as those of premixed engines. There was no backfire or knocking, and a very low NOx emission level was achieved by injecting -30 to -50 C cold hydrogen gas, pressurized by an LH2-pump, into the two-stroke engine. The LH2-pump was developed by the Musashi Institute of Technology, the barrel and the plunger are made of metal and a durable, low friction material, respectively. The plunger clearance was reduced to about 3 microns under operating conditions, thereby making fuel leakage from the plunger clearance negligible. Proper tank pressures were obtained according to the pump speed. The maximum speed of the car was recorded at 135 km/h Future objectives include the production of an engine with a higher compression ratio through the development of a high pressure pump having a discharge pressure above 6 MPa, and the improvement of the heat insulation performance of the LH2-tank.

A82-10968 # Liquid hydrogen for automotive vehicles Experimental results. W. Peschka (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Technische Physik, Vaihingen, West Germany) American Society of Mechanical Engineers and American Institute of Chemical Engineers, National Heat Transfer Conference, 20th, Milwaukee, WI, Aug 2-5, 1981, ASME Paper 81-HT-83 14 p. 21 refs. Members, \$2 00, nonmembers, \$4.00

A BMW-518 has been adapted for LH2-fuel, representing the first LH2-fueled car in Europe. This is a joint program between the German Research and Testing Laboratory for Aeronautics and the Research Institute for Motor-Transport Service and Automotive Engines at the University of Stuttgart. The program was established for demonstration of successful car-operation and and the safe handling of LH2-fuel during car operation and refueling. Based on earlier papers, more recent test results and experiences are reported about car operation and engine performance. The car has been driven

over an accumulated distance of about 1800 km on a test track. The test track consists of a loop of about 2.5 km in length, including a proper combination of straight level sections, curved sections and ascending sections. In order to demonstrate a safe liquid hydrogen refueling procedure that could also be used by untrained people, a semiautomatic computer operated refueling station has been developed. This refueling station is in successful operation. (Author)

A82-11784 # Improved efficiency in the sulfur dioxide lodine hydrogen cycle through the use of magnesium oxide. C F V Mason and M G Bowman (California, University, Los Alamos, NM). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2.

New York, American Society of Mechanical Engineers, 1981, p. 1411-1414 10 refs. Research sponsored by the U.S. Department of Energy

The reaction of iodine with dry magnesium oxide and magnesium sulfite hexahydrate was studied experimentally as a possible means of improving the efficiency of the sulfur dioxide-iodine cycle. When no extra water was introduced, the maximum product yield was 67% obtained at 423 K With excess water vapor, a nonporous plug was formed which prevented complete reaction. In the second case, maximum yield was 62% measured at 423 K showing that added water does not increase reaction products. This reaction gives an alternate route for producing hydrogen from water via the sulfur dioxide-iodine process. (Author)

A82-11785 # Parametric study of the cadmium thermoelectrochemical hydrogen cycle. J D Schreiber and R. H Carty (Institute of Gas Technology, Chicago, IL). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2 New York, American Society of Mechanical Engineers, 1981, p. 1415-1419, 21 refs

Hydrogen production by thermochemical water-splitting has been proposed as an energy conversion process for using heat to produce a chemical fuel, hydrogen, from water. One cyclic process of this type is based on the high-temperature thermal decomposition of cadmium oxide. To be efficient, this chemically simple cycle requires about 75% of its total energy input as nearly isothermal heat above 1500 K to drive the CdO decomposition step. It appears, therefore, to be ideal for an employment in conjunction with a solar heat source capable of supplying nearly isothermal heat. Attention is given to the electrochemistry oxidation of cadmium, the thermal decomposition of cadmium hydroxide, and the thermal decomposition of cadmium oxide. A description is given of a flow sheet analysis, taking into account evaluation studies conducted with the aid of a computer program.

A82-11786 # Alkaline solution water electrolysis - '81. J. N Murray (Teledyne Energy Systems, Timonium, MD) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2 New York, American Society of Mechanical Engineers, 1981, p 1420-1424 8 refs. Research supported by the U.S. Department of Energy

During the last two years several improvements in the alkaline solution electrolysis technology have been implemented in form of practical hardware. Attention is given to the catalyst system 'C-AN', alternative anode structures, a new proprietary anode electrocatalyst, alternates to the conventional chrysotile asbestos separator, the current status of hardware development, and the employment of simplistic and complex models for establishing the economics of hydrogen via water electrolysis.

G. R.

A82-11787 # Development status of the General Electric solid polymer electrolyte water electrolysis technology. L. J. Nuttall (General Electric Co., Wilmington, MA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2 New York, American Society of Mechanical Engineers, 1981, p. 1425-1429.

The solid polymer electrolyte used by the considered technology is a thin sheet (5 to 10 mil thickness) of a sulfonated fluoropolymer. It is a high strength plastic material which serves as the sole electrolyte, and also forms a rugged barrier between the hydrogen and oxygen chambers. The electrodes consist of a thin catalyst layer bonded to the surfaces of the plastic sheet A

03 HYDROGEN

description is presented of a 60-cell module, operating at the normal design point of 1000 amps per square foot. The module generates more than 2000 standard cubic feet per hour of hydrogen at a pressure of approximately 100 psig. Performance and cost projections are discussed.

G.R.

A82-11788 # Solar hydrogen system design considerations.

S. Lin, G. H. Parker, and M. E. Stella (Westinghouse Electric Corp.,
Advanced Energy Systems Div., Pittsburgh, PA) In Intersociety
Energy Conversion Engineering Conference, 16th, Atlanta, GA,
August 9-14, 1981, Proceedings. Volume 2.

York, American Society of Mechanical Engineers, 1981, p.
1430-1435

Attention is given to the Sulfur Cycle, a hybrid thermochemical-electrochemical process for the production of hydrogen and oxygen from water. The process, in its most general form, consists of two chemical reactions. The net result of the process is the decomposition of water into hydrogen and oxygen. The sulfur oxides are involved solely as recycling intermediates. The electrical power needed is much smaller than the power required in conventional water electrolysis. A description of the pressurized test unit is provided, and an investigation is conducted of key process variables.

A82-11790 # Lightweight hydrides for automotive storage of hydrogen. D A. Rohy, J F. Nachman, and T. A. Argabright (Solar Turbines International, San Diego, CA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2 New York, American Society of Mechanical Engineers, 1981, p. 1444-1448 Research supported by the U.S Department of Energy.

The primary objectives of the considered investigations are related to the reduction of the dissociation temperature of lightweight materials, and the development of new lightweight hydrides containing little, if any, critical material. Attention is given to the characteristics of metal hydrides, the characteristics of a magnesium-base alloy which is to be employed in hydrogen storage systems for automobiles, aspects of alloy development, and the evaluation of magnesium hydride alloys with the aid of a hydride cycling rig. New information concerning the effect of cycling on magnesium alloys is discussed.

A82-11791 # A study of factors influencing thermally induced backfiring in hydrogen fueled engines, and methods for backfire control. C. A. MacCarley (Denver, University, Denver, CO). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2.

New York, American Society of Mechanical Engineers, 1981 p. 1449-1453, 12 refs.

As an I.C engine fuel, hydrogen offers the advantages of no carbon compound exhaust emissions and high thermal efficiency. However, the problems of intake manifold backfire and decreased engine power output have been obstacles to automotive hydrogen use. Thermal causes of backfiring are investigated using a Cooperative Fuel Research engine and an electronically controlled, timed fuel injection system. Correlation of backfiring and injection timing are reported It is concluded that both maintenance of low average in-cylinder temperatures and the use of some means for timed, delayed fuel delivery are essential to achieving backfire-free operation under all conditions. A mechanical timed port injection system incorporating air flow controlled fuel metering is described as a means for providing delayed fuel delivery with variable injection timing Data are presented on the performance of a 2.6 liter, 4 cylinder engine using this system in naturally aspirated and turbocharged configurations (Author)

A82-11792 # Small-scale uses and costs of hydrogen derived from OTEC ammonia. G Strickland (Brookhaven National Laboratory, Upton, NY). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. New York, American Society of Mechanical Engineers, 1981, p 1459-1467. 32 refs Research sponsored by the U.S Department of Energy.

Ocean Thermal Energy Conversion (OTEC) plantships could produce NH3 from air and water, using energy derived from thermal gradients in tropical oceans NH3 can serve both as a commodity, for

the fertilizer and chemical industries, and as a liquid energy carrier for fuel use. Attention is given to the economic prospects for using OTEC NH3 as a hydrogen transport and storage medium for small users who want to assess the purchase of hydrogen vs. the cost of producing hydrogen at their sites. Hydrogen is readily obtained from NH3 at the point of end use, by dissociation and purification as required, for use as a chemical commodity or fuel. It is shown that high-purity H2 derived from OTEC NH3 might be competitive with H2 made at the point of end use via water electrolysis, or via steam reforming of natural gas.

A82-11844 * # The GA sulfur-iodine water-splitting process - A status report. G E Besenbruch, H. D. Chiger, K H McCorkle, J. H Norman, J. S. Rode, J. R Schuster, and P. W Trester (General Atomic Co, San Diego, CA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 3 New York, American Society of Mechanical Engineers, 1981, p 2143-2147. Research supported by the Gas Research Institute, Metal Properties Council, and General Atomic Co, Contracts No DE-AC02-80ET-26225, No. JPL-955263

The development of a sulfur-iodine thermal water splitting cycle is described. The process features a 50% thermal efficiency, plus all liquid and gas handling. Basic chemical investigations comprised the development of multitemperature and multistage sulfuric acid boost reactors, defining the phase behavior of the HI/12/H2O/H3PO4 mixtures, and development of a decomposition process for hydrogen iodide in the liquid phase. Initial process engineering studies have led to a 47% efficiency, improvements of 2% projected, followed by coupling high-temperature solar concentrators to the splitting processes to reduce power requirements. Conceptual flowsheets developed from bench models are provided, materials investigations have concentrated on candidates which can withstand corrosive mixtures at temperatures up to 400 deg K, with Hastelloy C-276 exhibiting the best properties for containment and heat exchange to 12. M S K.

A82-16346 Halogen acid electrolysis in solid polymer electrolyte cells. E. N. Balko, J. F. McElroy, and A. B. LaConti (General Electric Co., Wilmington, MA). *International Journal of Hydrogen Energy*, vol. 6, no. 6, 1981, p. 577-587. 27 refs.

The use of solid polymer electrolyte systems has been extended to the electrolysis of aqueous HCl and HBr. The reduced internal losses in these cells permits the production of hydrogen and the halogen at an energy consumption considerably less than that reported previously. Data are presented for the operational characteristics of the solid polymer electrolyte acid electrolysers operating over a range of current densities, pressures, feedstock compositions, and temperatures. (Author)

A82-16347 Mechanically stable hydride composites designed for rapid cycling. E. E Eaton, C. E. Olsen, H. Sheinberg, and W. A. Steyert (Los Alamos National Laboratory, Los Alamos, NM). *International Journal of Hydrogen Energy*, vol 6, no. 6, 1981, p. 609-623. 18 refs.

A number of porous composites were prepared by combining LaNi5 with copper, aluminium, lead-tin solder, lead, and polyure-thane. The preparation methods, hydrogen absorption, electrical and thermal conductivities, and kinetics of these mechanically stable, machinable composites are reported. (Author)

A82-16734 Technological innovation for success - Liquid hydrogen propulsion. J. L. Sloop (International Consultants on Energy Systems, Bethesda, MD) In Between Sputnik and the Shuttle - New perspectives on American astronautics.

San Diego, CA, Univelt, Inc., 1981, p. 225-239 23

efs.

Hydrogen produces the highest exhaust velocity of all chemical fuels, thus producing the highest rocket velocities, but also has a low density, only one-quarter that of water. The development of hydrogen as a rocket fuel was begun in the early 1900s, though experiments were few due to the difficulty of obtaining liquid hydrogen. Para- and orthohydrogen were discovered in 1926, and catalysts to prevent the natural conversion of para to ortho, which tended to boil away liquefied hydrogen, were invented in the 1950s. Rocket testing using liquid hydrogen began in the 1940s, and the demand for liquid hydrogen increased for testing of thermonuclear

weapons, although the supply of LH did not grow until the possibility for its use as a fuel for high altitude reconnaissance planes was investigated. Once NASA was created, the progress of an LH fueled stage for the Atlas rocket accelerated LH research, and led to NASA control of the development of the Saturn CV launch vehicle. An alternative use of liquid hydrogen as an automotive fuel is indicated.

A82-16784 Metal hydrides 1980; Proceedings of the International Symposium on the Properties and Applications of Metal Hydrides, Colorado Springs, CO, April 7-11, 1980. Volumes 1 & 2. Symposium sponsored by the U.S. Department of Energy, MPD Technology Corp., and Sandia National Laboratory. Edited by G. G. Libowitz (Allied Chemical Corp., Morristown, NJ) and G. D. Sandrock (Inco Research and Development Center, Suffern, NY). Lausanne, Elsevier Sequoia, S.A., 1980. Vol 1, 395 p., vol. 2, 485 p. Price of two volumes, \$165.

Papers were presented on the thermodynamics, kinetics, and surface effects of hydrides, in addition to nuclear magnetic resonance and Mossbauer studies. Attention was also given to hydrides of Laves-phase intermetallics and superconductivity in hydrides. Crystal structures and phase relations in hydrides were examined, as were the physical and electronic properties of various hydrides and their band structure. The general theory of hydrides was explored, and further notice was made of miscellaneous hydride systems, applications of hydrides, and the behavior of hydrogen in metals.

M.S.K.

A82-17129 Hydrogen from solar energy (Wasserstoff aus Sonnenenergie). W. Schnurnberger, W. Seeger, and H. Steeb (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für technische Physik, Stuttgart, West Germany). DFVLR-Nachrichten, Nov. 1981, p. 11-15. In German.

It is expected that, at some time in the foreseeable future, processes for obtaining hydrogen on the basis of a use of nonfossil energy will be economically feasible. Nonfossit energy sources considered are related to water power, nuclear energy, and solar energy. The current status of various approaches for the decomposition of water is examined, taking into account a supply of the required energy in form of heat, electric power, or light energy. At the present time only the technology of water electrolysis is sufficiently advanced to provide hydrogen on a large scale. Considerable improvements regarding current electrolysis technology with respect to efficiency and required capital costs should be possible within the foreseeable future. Approaches are considered to obtain the required electric power for the electrolysis with the aid of processes based on the utilization of solar cells. Attention is given to improved procedures for water electrolysis, and approaches for achieving optimal operational relations between solar-cell generators and electrolysis equipment. G.R.

A82-17130 The storage of hydrogen (Zur Wasserstoff-Speicherung). C. Carpetis (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für technische Physik, Stuttgart, West Germany). *DFVLR-Nachrichten*, Nov. 1981, p. 15-22. In German.

It is pointed out that a storage of hydrogen with the aid of conventional methods is technically feasible, taking into account the storage of hydrogen as a gas at higher pressures and its storage as a liquid. On the basis of the currently foreseeable production costs for hydrogen, an employment of conventional storage procedures appears acceptable. There are, in addition to the conventional methods, also a number of novel concepts for hydrogen storage. However, the practical feasibility of an employment of these concepts in connection with hydrogen production and distribution systems has still to be demonstrated. A brief description is presented of the conventional storage procedures. In connection with a discussion of the novel concepts, attention is given to a storage of hydrogen in the form of metal hydrides and approaches to store hydrogen with the aid of materials which adsorb it at low temperatures (60 to 100 K). A comparative study concerning the economics of the various storage procedures is also conducted. G.R.

A82-17131 The generation of current from hydrogen (Stromerzeugung aus Wasserstoff). H. J. Sternfeld, H. Wojkowsky, and K. Wolfmuller (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für chemische Antriebe und Ver-

fahrenstechnik, Lampoldhausen, West Germany). DFVLR-Nachrichten, Nov 1981, p. 22-26. In German.

Factors regarding the storage of electrical energy and approaches to meet peak loads demands will become increasingly important in the future. A chemical storage of electrical energy in the form of hydrogen appears to offer a suitable approach to satisfy requirements related to these trends. For an implementation of such an approach. it will be necessary to solve the problem of an economical generation of electrical power from hydrogen. Procedures for such a generation of electric power can be divided into two categories, which are related to a use of fuel cells and an employment of steam or gas turbine processes. Suitable fuel cells can be based on a use of hydrogen and oxygen or an employment of hydrogen and air. The use of the power generation procedures of the second category involves a primary transformation of the chemical energy of the fuel into heat. A description is presented of an evaluation study regarding the different types of power stations. Attention is given to a possible technological employment of steam generators based on the use of hydrogen and oxygen in the 1980's.

A82-17132 Aspects concerning the safety of hydrogen (Sicherheitsaspekte des Wasserstoffs). M. Fischer and H. Eichert (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für technische Physik, Stuttgart, West Germany). DFVLR-Nachrichten, Nov. 1981, p. 33-37. In German.

Questions regarding the safety of operations and processes involving hydrogen arise in connection with the envisaged employment of hydrogen in a global energy system. A description is presented of an investigation in which physical-chemical characteristics and safety-technological parameters of hydrogen are compared with the corresponding data for methane and gasoline. An examination of the environmental effects related to a use of hydrogen as fuel shows that there are no pollutants in the case of terrestrial applications. The effects of an introduction of certain amounts of water vapor into the higher layers of the atmosphere would have to be considered in connection with an employment as aircraft fuel. Attention is given to ignition limits, the energy required for ignition, the combustion rate, density, ignition temperature, the diffusion coefficient, deflagration, detonation, storage, transportation, safety aspects regarding liquid hydrogen, experience related to an employment of hydrogen, hydrogen embrittlement, and further research required with respect to some aspects of safety technology.

A82-17150 Rechargeable metallic hydrides for hydrogen storage. H. C. Angus (MPD Technology, Ltd., Birmingham, England) Physics in Technology, vol. 12, Nov. 1981, p. 245-250, 257. 5 refs.

The principles and methods of storing hydrogen in solid form in hydrides are examined. Hydrogen at certain temperatures and pressures is absorbed in large quantities by ternary hydride alloys, usually composed of Ti, Li, or Mg, with Fe and Ni. Decreasing pressures, such as occur when the hydrogen gas is released, allow the flow of hydrogen from the solid. A plateau pressure is defined for the amount of heat required to 'fill' the hydride, and which is specific for each alloy. Properties of thermal conductivity, specific heat, the ability to absorb impurities, and volume change during hydriding affect the suitability of the hydriding material, and it is noted that most hydrides are brittle and must be chosen to not collapse into a powder during hydriding. Various hydrogen storage configurations are mentioned, with the largest static store now weighing a ton.

M.S.K.

A82-17290 Liquid hydrogen - An outstanding alternate fuel for transport aircraft. W. M. Hawkins. In: Safe and efficient management of energy; Proceedings of the Thirty-third Annual International Air Safety Seminar, Christchurch, New Zealand, September 15-18, 1980. Arlington, VA, Flight Safety Foundation, Inc., 1980, p 270-295.

Liquid hydrogen is proposed as an excellent alternate aircraft fuel, owing to its worldwide availability, low cost, ability to be transported and stored without difficulty, and minimum impact on the environment. NASA compared the characteristics and performance of three aircraft using (1) synthetic Jet A, (2) liquid methane, and (3) liquid hydrogen. The liquid hydrogen aircraft was found to weigh considerably less than the others, thereby reducing the take-off gross weight. Every pound of hydrogen produces 51,590 BTU's, whereas a pound of Jet A produces only 18,400 BTU's.

Moreover the liquid hydrogen aircraft uses the least energy in spite of aerodynamic disadvantages of the aircraft and high energy needs for liquefaction and the manufacturing process. Liquid hydrogen also has a fly-over noise level of 89 decibels compared to the 94 decibels for the Synjet aircraft. A simple system of laminar flow maintenance using liquid hydrogen is discussed, and several safety features of the fuel are noted.

J.F.

A82-18392 Thermochemical processes for hydrogen production by water splitting - From theory to practice. G. De Beni (Commission of the European Communities, Joint Research Center, Ispra, Italy). (Electrochemical Society Meeting, Hollywood, FL, Oct. 5-10, 1980.) Electrochemical Society Journal, vol. 129, Jan. 1982, p. 67-72, 27 refs.

Theoretical energy requirements for water splitting are well known. The values of Delta-H and Delta-S of 'ideal' chemical reactions suitable for thermochemical cycles can be computed. The chemists, however, must work with 'real' reactions. The constraints and the problems due to the 'nonideality' of reactions are discussed. These problems are: incertitude of thermodynamic data and phase diagrams; separation of excess water and other chemical products; low temperature side of the cycles; materials of construction, heat exchanges and heat coupling with available heat source. (Author)

N82-11223*# National Aeronautics and Space Administration, Washington, D $\,$ C

TECHNICAL AND ECONOMIC ASPECTS OF HYDROGEN STORAGE IN METAL HYDRIDES

R Schmitt Sep 1981 44 p refs Transl into ENGLISH from Proc of the Intern Workshop on Hydrogen and its Perspectives, v 1, Liege, 1976 p 1-48 Presented at the Intern Workshop on Hydrogen and its Perspectives, Liege, 15-18 Nov 1976 Original language document was announced as A78-18842 Transl by Scientific Translation Service, Santa Barbara, Calif Original doc prep by Battelle Memorial Inst., Geneva (Contract NASw-3198)

(NASA-TM-76610) Avail NTIS HC A03/MF A01 CSCL 21D

The recovery of hydrogen from such metal hydrides as LIH, MgH2, TiH2, CaH2 and FeTiH compounds is studied, with the aim of evaluating the viability of the technique for the storage of hydrogen fuel. The pressure-temperature dependence of the reactions, enthalpies of formation, the kinetics of the hydrogen absorption and desorption, and the mechanical and chemical stability of the metal hydrides are taken into account in the evaluation. Economic aspects are considered Development of portable metal hydride hydrogen storage reservoirs is also mentioned.

N82-11225*# National Aeronautics and Space Administration, Washington, D C

THE STORAGE OF HYDROGEN IN THE FORM OF METAL HYDRIDES: AN APPLICATION TO THERMAL ENGINES C Gales (Comm a l'Energie Atomique, Centre d'Etudes Nucl de Grenoble) and P Perroud (Comm a l'Energie Atomique, Centre d'Etudes Nucl de Grenoble) Aug 1981 39 p refs Transl into ENGLISH from Proceedings of the Assoc des Ingr Electriciens sortis de L'Inst Electrotech Montefiore, Belgium, v 1, 1977 p 1-34 Conf held at Liege, Belgium, 15-18 Nov 1976 Original language document was announced as A78-18845 Transl by Kanner (Leo) Associates, Redwood City, Calif (Contract NASw-3199)

(NA SA-TM-76609) Avail NTIS HC A03/MF A01 CSCL 21D

The possibility of using LaNi56, FeTiH2, or MgH2 as metal hydride storage systems for hydrogen fueled automobile engines is discussed. Magnesium copper and magnesium nickel hydrides studies indicate that they provide more stable storage systems than pure magnesium hydrides. Several test engines employing hydrogen fuel have been developed a single cylinder motor originally designed for use with air gasoline mixture, a four-cylinder engine modified to run on an air hydrogen mixture, and a gas subtine.

N82-11257# Brookhaven National Lab , Upton, N Y FUSION AS A SOURCE OF SYNTHETIC FUELS

J R Powell, J A Fillo, and M Steinberg 1981 10 p refs Presented at the Energy in the Man-Built Environ The Next Decade Specialty Conf, Vail, Colo, 3 Aug 1981 (Contract DE-AC02-76CH-00016) (BNL-29281, CONF-810808-2) HC A02/MF A01

Avail

NTIS

Efficient production of hydrogen-based fuels from fusion is addressed. Water splitting reactions discussed include high temperature electrolysis of steam, thermochemical cycles, hybrid electrochemical/thermochemical, and direct thermal decomposition. High temperature electrolysis appears to be the simplest and most efficient process with efficiencies of 50 to 70% (Fusion to hydrogen chemical energy), depending on process conditions.

N82-11262# Los Alamos Scientific Lab , N Mex HYDROGEN STORAGE-BED DESIGN FOR TRITIUM SYSTEMS TEST ASSEMBLY

Hatice S Cullingford, Michael G Wheeler, and John W McMullen 1981 18 p refs Presented at the Intern Symp on Metal-Hydrogen Systems, Miami Beach, Fla. 13-15 Apr 1981 (Contract W-7405-eng-36)

(DE81-025336, LA-UR-81-1906, CONF-810497-1) Avail NTIS HC A02/MF A01

The Los Alamos National Laboratory complete the design of a hydrogen storage bed for the Tritium Systems Test Assembly (TSTA). Our objective is to store hydrogen isotopes as uranium hydrides and recover them by dehydriding. The specific use of the storage bed is to store DT gas as U(D,T)3 when it is required for the TSTA. The hydrogen storage bed consists of a primary container in which uranium powder is stored and a secondary container for a second level of safety in gas confinement. The primary container inlet and outlet gas lines, cartridge heaters, and instrumentation are assembled in the secondary container. The design of the hydrogen storage bed is presented, along with the modeling and analysis of the bed behavior during hydriding-dehydriding cycles.

N82-12266# Chemische Werke, Huels (West Germany)

ASSESSMENT OF POTENTIAL FUTURE MARKETS FOR THE PRODUCTION OF HYDROGEN FROM WATER Final Report

Helmut Kalenda and Gerhard Ruckelshauss Bonn Bundesministerium fuer Forschung und Technologie Jan 1981 232 prefs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie (BMFT-FB-T-81-012, ISSN-0340-7608) Avail NTIS

(BMFT-FB-T-81-012, ISSN-0340-7608) Avail NTIS HC A11/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 39,60

The market potential of hydrogen as a chemical raw material and a secondary energy carrier in the Federal Republic of Germany was assessed for various market sectors for the period from 1985 to 2025 The present status of research and technology is depicted. The hydrogen demand in the market sectors of chemistry, petroleum refining industry, steel production, energy, and transport are assessed. Hydrogen production costs for different actual and future technologies are asessed and compared with the production of competing energy carriers, including nuclear high temperature heat. The anticipated demand of hydrogen, broken down according to market sectors is given for the years 1985, 2005 and 2025, taking into account the development of the national and global energy demand. Eight technologies for the production of hydrogen and four technologies for the production of synthetic natural gas are compared, both technically and economically. Hydrogen from high temperature electrolysis of steam is expected to enter the market as a competitive energy carrier not before 2015 to 2025 Author (ESA)

N82-14382# Brookhaven National Lab , Upton, N Y DEVELOPMENT OF A METAL HYDRIDE PROCESS FOR HYDROGEN RECOVERY FROM SUPPLEMENTED NATURAL GAS

F Reidinger and F 8 Hill 1981 6 p refs Presented at the 2nd World Congr of Chem Engr, Montreal, Canada, 4 Oct 1981

(Contract DE-AC02-76CH-00016)

(DE81-022685, BNL-29461, CONF-811007-4) Avail NTIS HC A02/MF A01

A metal hydride hydrogen recovery process which has commercially attanable pretreatment requirements, a thermal reactivation procedure with temperatures not exceeding 500 C with reactivation rquired at intervals of 100 absorption desorption cycles, and an alloy lifetime of the order of 70,000 cycles is described. Mercaptan-alloy interactions are considered. The

interaction of CO with the alloy in the presence of hydrogen appears quite complicated. The present work indicates that CO 2 concentrations up to 500 ppM may have negligible effect on the rate of hydrogen absorption after an initial exposure to CO2 and hydrogen. If a slower hydrogen sorption rate can be tolerated then higher CO2 levels may be acceptable

N82-15220# Brookhaven National Lab , Upton, N Y Dep. of Energy and Environment

SYSTEMS ANALYSIS OF HYDROGEN/NATURAL GAS SUPPLEMENTATION AND SEPARATION

M. Beller, J DAcierno, and A Hermelee Apr 1981 6 p refs Presented at the 2nd World Congr of Chem Eng., Montreal.

(Contract DE-AC02-76CH-00016)

(DE81-021383; BNL-29520, CONF-811007-5) Avail NTIS HC A02/MF A01

Specific potential markets for hydrogen are investigated and then examines the mix of customers comprising these markets The pipeline infrastructure, its capability for use to store and transmit hydrogen, and the incentives and drawbacks in this area are studied. There is sufficient use of both hydrogen and natural gas in potential hydrogen-consuming industries to overcome the problem of reinjection of natural gas into the pipeline after separation

N82-15231# Futures Group, Glastonbury, Conn AN ASSESSMENT OF NONFOSSIL HYDROGEN Final

E Fein and T Munson Dec 1980 221 p refs Prepared for Gas Research Inst.

(GRI Proj 50 14-310-0274)

(PB81-246522: GRI-79/0108) NTIS Avail

HC A10/MF A01 CSCL 21D

The potential for hydrogen produced from nonfossil energy sources as an energy carrier is examined Water electrolysis, thermochemical systems, and various solar radiation processes are evaluated as hydrogen production methods. Long-term and short-term hydrogen storage technologies were also considered. Various possible hydrogen end-uses were appraised, including its role as an industrial chemical, a heating fuel for stationary applications, a vehicular fuel, and an aircraft fuel. The role of coal in future hydrogen production was seen as providing the major competitive technology to nonfossil hydrogen production. Conditions (constraints placed on the use of natural fossil fuels an synthetic fossil fuels) under which hydrogen might be produced primarily from nonfossil energy sources are analyzed. A possible scenario was suggested for the transition to a nonfossil energy era, and areas where hydrogen could be expected contribute to domestic energy needs were indicated

N82-15542# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Stuttgart (West Germany) Technische Physik

HYDROGEN AS CARRIER OF SECONDARY ENERGY: PROPOSAL FOR A RESEARCH AND DEVELOPMENT **PROGRAM**

H Buhl, C Carpetis, J. Nitsch, W Peschka, T Schott, W. Seeger, W Schnurnberger, H Steeb, and H J Sternfeld Jun. 1981 94 p refs in GERMAN, ENGLISH summary Report will also be announced as translation (ESA-TT-732) (DFVLR-Mitt-81-10) Avail NTIS HC A05/MF A01; DFVLR.

Cologne DM 14.20

The nuclear or solar production of hydrogen may become economically attractive in the future. The technological problems of the production and the introduction of hydrogen into the energy system are shown Suitable research development efforts are recommended to achieve a complete ensured scope of knowledge concerning hydrogen systems

04 FUELS AND OTHER SOURCES OF ENERGY

Includes fossil fuels, nuclear fuels, geothermal and ocean thermal energy, tidal energy, and wind energy

A82-10372 Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces. S Maj (Polska Akademia Nauk, Instytut Geofizyki, Warsaw, Poland). Acta Geophysica Polonica, vol. 28, no. 3, 1980, p 233-240 10 refs.

A82-10965 # Fuel for future transport aircraft. G. D. Brewer (Lockheed-California Co., Burbank, CA). American Society of Mechanical Engineers and American Institute of Chemical Engineers, National Heat Transfer Conference, 20th, Milwaukee, WI, Aug. 2-5, 1981, ASME Paper 81-HT-80. 8 p. 6 refs. Members, \$2.00; nonmembers, \$4.00.

Despite attempts at conservation and the development of synthetic aviation-grade kerosene from alternative fossil fuel materials, it is widely recognized that alternatives to conventional petroleum-base aircraft fuels must become available in the near future. The present paper discusses the prospects for liquid hydrogen. as a future fuel for transport aircraft. Advantages of liquid hydrogen over synthetic fuels and liquid methane as alternative fuels in the areas of availability, safety, pollution, relative energy efficiency as a function of trip length and aircraft weight, overall costs and airport compatibility are considered. The possible requirements for a development program aimed at preparing liquid hydrogen for use in operational aircraft are examined, and the probable time characteristics of fuel use during the transition to liquid hydrogen, which may significantly replace synthetic fuels by the year 2000, are considered A comprehensive plan for liquid hydrogen fuels R&D is then presented which is currently being considered for implementation on an international basis

A82-11033 One-dimensional model of vapor-dominated geothermal systems. J. M Straus (Aerospace Corp., Space Sciences Laboratory, Los Angeles, CA) and G Schubert (Aerospace Corp., Space Sciences Laboratory, California, University, Los Angeles, CA). Journal of Geophysical Research, vol. 86, Oct. 10, 1981, p. 9433-9438, 15 refs. NSF Grant No. ENG-76-82119.

A one-dimensional model of vapor-dominated geothermal systems in the natural state is developed in order to study the ranges of the heat and mass transport and flow resistance at which a system is capable of existing in the vapor-dominated state. The model consists of a near-surface condensate layer lying above a two-phase counterflow region with rising steam and descending water in a porous saturated medium. Examination of models with condensate layers several hundred meters thick and reservoir temperatures near 513 K, characteristic of real systems, reveals them to have net mass flow rate/thermal conductivity ratios less than about 2.5 x 10 to the -7th K sec-squared/cu m and permeability/thermal conductivity ratios greater than 4.5 x 10 to the -17th m sec-cubed K/kg. Application of the model to the temperature and pressure data for the main reservoir of the Kawah Kamojang geothermal system in West Java indicates a permeability/thermal conductivity ratio between 10 to the -15th and 10 to the -14th m sec-cubed K/kg, or a permeability between 4 and 40 mdarcy for a thermal conductivity of 4 J/m per sec per K. Results also require the existence of a lower permeability cap Overlying the higher permeability main reservoir in order to stabilize the water layer above the steam region. A.L W.

A82-11834 # Present status of Florida Power Corporation's D.O.E. funded feasibility study of the Higgins plant repowering/coal gasification project. M. H. Kleinman (Florida Power Corp., St. Petersburg, FL) and E. Lechpammer (Stone and Webster Engineering Corp., Boston, MA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3.

Mechanical Engineers, 1981, p 2086-2090 Research supported by the U.S Department of Energy.

A82-11835 # Status report on Central Maine Power Company's DOE Funded feasibility study of the Sears Island integrated gasification combined cycle power plant. R. E. Cummings and P. C. Hastings (Central Maine Power Co., Augusta, ME) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 3

York, American Society of Mechanical Engineers, 1981, p. 2091-2095. Research supported by the U.S. Department of Energy.

A82-11836 # Coal fired air turbine cogeneration. R W Foster-Pegg (Westinghouse Electric Corp., Pittsburgh, PA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 3

New York, American Society of Mechanical Engineers, 1981, p 2103-2108, 7 refs

Fuel options and generator configurations for installation of cogenerator equipment are reviewed, noting that the use of oil or gas may be precluded by cost or legislation within the lifetime of any cogeneration equipment yet to be installed. A coal fueled air turbine cogenerator plant is described, which uses external combustion in a limestone bed at atmospheric pressure and in which air tubes are sunk to gain heat for a gas turbine. The limestone in the 26 MW unit absorbs sulfur from the coal, and can be replaced by other sorbents depending on types of coal available and stringency of local environmental regulations. Low temperature combustion reduces NOx formation and release of alkali salts and corrosion. The air heat is exhausted through a heat recovery boiler to produce process steam, then can be refed into the combustion chamber to satisfy preheat requirements. All parts of the cogenerator are designed to withstand full combustion temperature (1500 F) in the event of air flow stoppage. Costs are compared with those of a coal fired boiler and purchased power, and it is shown that the increased capital requirements for cogenerator apparatus will yield a 2 8 year payback Detailed flow charts, diagrams and costs schedules are included

MSK

A82-11837 # Enthanol fuels from biomass projects. B C. B Hsieh In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9 14, 1981, Proceedings Volume 3 New York, American Society of Mechanical Engineers, 1981, p 2109-2111.

About 100 projects are proposed or underway to convert organic crops such as corn and grains or waste organic material into a clean usable ethyl alcohol fuel. Total production capacity could reach more than two billion gallons per year in 1985, excluding beverage and industrial uses. Congressional appropriation of approximately one-half billion dollars to DOE/USDA for loan guarantees and federal and state laws exempting excise taxes can make this ethanol fuel from biomass possible. An overview and status of the projects will be reviewed. Net energy production of ethyl alcohol from biomass and the impacts of increasing alcohol fuel use will also be discussed.

(Author)

A82-11848 # An overview of peat gasification. D. V. Punwani (Institute of Gas Technology, Chicago, IL). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2172-2177. 21 refs.

Thermal and biological peat gasification processes are reviewed, with research showing that peat is high in both oxygen and hydrogen, and also nitrogen, which can be used to form ammonia as a byproduct. The hydrogen-carbon ratio of peat has been shown to exceed that of subbituminous coal, indicating less of a need to supply more hydrogen in the formation of gaseous fuels. The gasification process involves crushing the peat into particles smaller than 2 mm, which cascade through drying air into a gasifier, where gases from the hydrogasifier induce hydropyrolysis. The char then flows into a reactor with steam and oxygen to make synthesis gas. Minnesota peat has shown the highest hydrocarbon yields in the U.S., and economic comparisons show peak gasification has economic parity with other means of producing SNG. Experiments have

04 FUELS AND OTHER SOURCES OF ENERGY

also shown the feasibility of wet peat conversion using a peat-water slurry in an anaerobic digestor to produce methane. Building of pilot plants is suggested as necessary to verify existing processes. M.S.K.

A82-11849 # Production of synthetic crude oil from coal using the TOSCOAL pyrolysis process. D. H. Cortex and C. J. LaDelfa (Tosco Corp., Los Angeles, CA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2178-2183.

A82-11850 # An overview of fluidized-bed combustion /FBC/ design practice. J-Y Shang, J E. Notestein, and J. S. Mei (U.S. Department of Energy, Morgantown Energy Technology Center, Morgantown, WV). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2184-2191.

A short history of fluidized bed coal combustion is provided, noting that addition of a limestone bed contributes to sulfur retention, and comparisons are made with stoker and pulverized bed boilers. Advantages to fluidized bed combustion (FBC) are given as the thermal inertia of the limestone bed, inherent vigorous mixing for turbulent, efficient combustion, and larger particle size than in a catalytic cracker Major components of an FBC are described, including windbox, distributor, feeder system, combustion chamber, bed material drainage, and primary dust recovery system. Fundamental differences between FBC and conventional boiler technology are stressed and design considerations for an FBC are listed with explanations. Recirculation of fly ash is shown to be effective only with an in-combustor vortex, which returns the ash to the flame before it has time to cool. Finally, ongoing experiments to determine the relative usefulness of burning various alternate fuels such as shales, lignite, and shredded tires in an FBC are reported MSK

A82-11851 # Application of HTGR process heat to oil shale retorting. D. C. Wadekamper, I. N. Taylor, T. E. Gleason (General Electric Co., Pleasanton, CA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2192-2197.

The currently developed oil shale retorting processes depend on some portion of their product to provide heat energy for process operation. In an attempt to increase the fossil fuel reserves of the United States, as well as decrease environmental pollution, it has been suggested that an High Temperature Gas Reactor (HTGR) be used to supply the heat necessary for the retorting oil shale thus freeing additional petroleum products for sale. The TOSCO II process was selected as a typical oil shale retorting process and a detailed evaluation of the energy requirements was made. Various scenarios to replace selected portions of the process energy requirements with HTGR generated heat are described. The improvements in product yields and reductions in environmental pollution levels associated with a HTGR process heat scheme are summarized.

(Author)

A82-12021 † Jet fuel from carbon (Reaktivnoe toplivo iz uglia). A A. Krichko, M K. Iulin, A C. Arifulin, T. C. Nikiforova, and V. A. Puchkov (Akademiia Nauk SSSR, Institut Goriuchikh Iskopaemykh, Moscow, USSR). Khimiia i Tekhnologiia Topliv i Masel. no. 9, 1981, p. 3-5. 8 refs. In Russian.

A jet fuel of the T-8V type has been obtained by isomerization and hydrogenation at 4 MPa of the hydrorefined 180-320 C fraction of a liquid-phase carbon hydrogenation product. The flow scheme and the material balance of the process are presented.

V.L.

A82-12022 † A protective additive for jet fuels (Zashchitnaia prisadka k reaktivnym toplivam). O P. Lykov, G I. Shor, V P. Lapin, V. V. Sashevskii, and L. I. Mosina (Moskovskii Institut Neftekhimicheskoi i Gazovoi Promyshlennosti, Moscow, USSR). Khimiia i Tekhnologiia Topliv i Masel, no. 10, 1981, p. 37-40. 6 refs. In Russian

A study has been carried out to investigate the protective action of an additive to jet fuels which consists of a mixture of dimers and trimers of synthetic fat acids. Results indicate that there exists a correlation between changes in the protective properties of the fuel

as a function of the additive content, on the one hand, and changes in certain electrophysical characteristics of the fuel (e.g., conductivity, contact potential difference change, and electrifiability), on the other hand.

A82-12275 Geothermal systems: Principles and case histories. Edited by L. Rybach (Zurich, Eidgenossische Technische Hochschule, Zurich, Switzerland) and L. J. P. Muffler (U.S. Geological Survey, Menlo Park, CA). Chichester, Sussex, England and New York, Wiley-Interscience, 1981, 371 p. \$61.95.

The classification of geothermal systems is considered along with the geophysical and geochemical signatures of geothermal systems, aspects of conductive heat transfer and regional heat flow, and geothermal anomalies and their plate tectonic framework. An investigation of convective heat and mass transfer in hydrothermal systems is conducted, taking into account the mathematical modelling of hydrothermal systems, aspects of idealized convective heat and mass transport, plausible models of geothermal reservoirs, and preproduction models of hydrothermal systems. Attention is given to the prospecting for geothermal resources, the application of water geochemistry to geothermal exploration and reservoir engineering, heat extraction from geothermal reservoirs, questions of geothermal resource assessment, and environmental aspects of geothermal energy development. A description is presented of a number of case histories, taking into account the low enthalpy geothermal resource of the Pannonian Basin in Hungary, the Krafla geothermal field in Northeast Iceland, the geothermal system of the Jemez Mountains in New Mexico, and extraction-reinjection at the Ahuachapan geothermal field in El Salvador

A82-12400 Energy from biomass and wastes V; Proceedings of the Fifth Symposium, Lake Buena Vista, FL, January 26-30, 1981. Symposium sponsored by the Institute of Gas Technology. Chicago, Institute of Gas Technology, 1981. 1100 p \$75

Papers are presented in the areas of biomass production and procurement, biomass and waste combustion, gasification processes, liquefaction processes, environmental effects and government programs. Specific topics include a water hyacinth wastewater treatment system with biomass production, the procurement of wood as an industrial fuel, the cofiring of densified refuse-derived fuel and coal, the net energy production in anaerobic digestion, photosynthetic hydrogen production, the steam gasification of manure in a fluidized bed, and biomass hydroconversion to synthetic fuels. Attention is also given to the economics of deriving alcohol for power applications from grain, ethanol fermentation in a yeast-immobilized column fermenter, a solar-fired biomass flash pyrolysis reactor, particulate emissions from controlled-air modular incinerators, and the DOE program for energy recovery from urban wastes.

A82-12531 U.S. Department of Energy liquid synfuels overview. E. J. Lievens, Jr. (U.S. Department of Energy, Washington, DC) In The year of the Shuttle, Proceedings of the Eighteenth Space Congress, Cocoa Beach, FL, April 29-May 1, 1981.

Cocoa Beach, FL, Canaveral Council of Technical Societies, 1981, p. 3-1 to 3-17

The U.S. Department of Energy (DOE) has been participating in four programs to convert coal to liquid synfuels through direct liquefaction: the Solvent Refined Coal programs (SRC-I and SRC-II), the Exxon Donor Solvent Pilot Plant, and the Ebullated-Bed Pilot Plant (H-coal). The processes, products, and technical status of each of the DOE liquefaction programs are described. The Administration's proposal to discontinue DOE activities in these programs, while assisting industrial participants, is discussed. Finally, the results of DOE studies of industrial needs to implement a major coal derived liquid synfuel program are summarized. Results predict that resources are adequate to develop a capacity of liquid fuels equal to a million barrels/day by the year 2000, the impediments to increasing this capacity to three million barrels/day in that time span are identified.

A82-12533 Biomass resources for alcohol fuels. J. E. MacDowell (Planning Research Corp., Cocoa Beach, FL). In The year of the Shuttle, Proceedings of the Eighteenth Space Congress, Cocoa Beach, FL, April 29-May 1, 1981. Cocoa Beach, FL, Canaveral Council of Technical Societies, 1981, p. 3-42 to 3-63, 20 refs.

The production of alcohol fuel from biomass represents a fast and practical means of adding to the dwindling petroleum supply. The biomass feed-stocks which will feed the alcohol distilleries must be carefully selected. Using food chain biomass crops for conversion to alcohol will cause a reduction in the amount of food available and increase the cost of food and alcohol feedstocks. The food chains should not be drastically interrupted, and agricultural economic balances should not be altered. Various alternatives to alcohol production are presented, which lie within the confines of selected biomass feedstocks and will not interrupt normal agricultural activities. A corn processing and distillation process is shown graphically as an example, the biomass to alcohol conversion potential of feedstocks is given, and the potential cropland for conversion in the U.S.A. is shown as a percentage of the nation's total land area.

J.F.

A82-12888 Study of the electric conductivity of plasma from fuel combustion products containing a weakly ionizing impurity. E. K. Chekalın, V. A. Tishchenko, and I. B. Rozhdestvenskii (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR) (Teplofizika Vysokikh Temperatur, vol. 19, Mar-Apr. 1981, p. 225-229.) High Temperature, vol. 19, no. 2, Sept. 1981, p. 159-163. 12 refs. Translation.

The Q factor of a high-frequency circuit is measured to determine experimentally the electric conductivity of a combustion-product plasma using high-ash coals with potassium impurities at the outlet of a high-temperature cyclonic combustion chamber. The electric conductivity of the plasma formed from the combustion products of the coal is calculated under conditions comparable to the experimental conditions. Calculations are carried out both for a completely equilibrium composition, taking into account condensed compounds of potassium with aluminum and silicon oxides, and for a 'frozen' composition in which potassium compounds of this type are neglected.

A82-14008 # Implementation of a siting methodology for utility size WECS in western Massachusetts and northwestern Connecticut. R. H. Kirchhoff and F. C. Kaminsky (Mæsachusetts, University, Amherst, MA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2540. 10 p. 11 refs.

This paper describes a long term research project by Northeast Utilities and the University of Massachusetts to identify candidate sites for utility size wind energy systems in Western Massachusetts and Northwestern Connecticut. A generalized methodology is described for identifying the candidate sites. This methodology includes the use of biological wind prospecting, data collection with TALA kites, computerized wind mapping with MATHEW, and the installation of long run data collection stations. This paper also describes the use of a mass consistent flow model known as MATHEW in developing computerized wind maps for selected regions of the area under study. (Author)

A82-14395 # Aviation gasoline versus automotive gasoline. K. J Biehl (FAA, Technical Center, Atlantic City, NJ). American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Conference, Dayton, OH, Aug. 11-13, 1981, Paper 81-1705. 4 p. 5 refs.

FAA research on aviation gasoline versus automotive gasoline is reviewed, noting regulations governing engine/aircraft fuel systems. The research has shown that from the antiknock/octane rating standpoint, only aviation grade 80/87 fuel may be replaced by autogas. Fuel-system vapor lock is identified as a major problem requiring definition by aircraft fuel system design relative to operational limitations. Future testing will evaluate both high-wing and low-wing systems to investigate material incompatibility and corrosion; antiknock, preignition and deposit ignition, engine durability and spark-plug operation.

A82-14986 Fuels from biomass and wastes. Edited by D L. Klass (Institute of Gas Technology, Chicago, IL) and G. H. Emert (Arkansas, University, Fayetteville, AR). Ann Arbor, MI, Ann Arbor Science Publishers, Inc., 1981. 602 p. \$39.95.

The production, use, and effects of fuels from biomass and waste energy sources are discussed. Biomass procurement from silviculture, including hybrid poplar and sycamore farms, in addition

04 FUELS AND OTHER SOURCES OF ENERGY

to the growth of mass algal culture and Jerusalem artichokes for fuels are considered. The conversion of biomass and solid waste materials through biological and thermal gasification, hydrolysis and extraction, and fermentation to produce ethanol, along with natural and thermal liquefaction processes involving euphorbia lathyris and cellulosic materials are elaborated. Environmental and health aspects of biomass and waste conversion systems are outlined, noting the large land surface areas needed for significant contributions to total demands from biomass, specific instances and case studies are reviewed for biomass use in Indiana, the Dominican Republic, the southeast U.S., and in small wood stoves.

M.S.K.

A82-15722 † Optimization of the composition and antidetonation properties of Al-93 gasoline (Optimizatsiia komponentnogo sostava i antidetonatsionnykh svoistv benzina Al-93). B A Englin, lu. N Nilov, V E Emel'ianov, and G. E. Levinson (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Neftianoi Promyshlennosti, Moscow, USSR). Khimiia i Tekhnologiia Topliv i Masel, no. 11, 1981, p. 19-23. 7 refs. In Russian

The antidetonation properties of Al-93 gasoline are examined and compared with detonation specifications on automobiles manufactured by the VAZ plant. It is shown that the octane number of Al-93 may be reduced by optimizing its composition. Results of a evaluation of 90-91-octane gasolines containing methyl-tert-butyl ether are presented.

V.L.

A82-17007 Comparison of Michigan Basin crude oils. E. A. Vogler (Indiana, University, Bloomington, IN), P. A. Meyers (Michigan, University, Ann Arbor, MI), and W. A. Moore (Central Michigan University, Mt. Pleasant, MI). Geochimica et Cosmochimica Acta, vol. 45, Nov. 1981, p. 2287-2293. 24 refs. Grant No. NGR-15-003-118.

Michigan Basin oils from the Ordovician Trenton, Silurian Niagaran, and Devonian Dundee formations have been geochemically compared by GC, GC-MS, and carbon isotope mass spectrometry. One oil from each formation was selected for detailed analysis which included measurement of individual n-alkane delta 13 C values. The Ordovician and Devonian oils are strikingly similar to one another, yet clearly different from the Silurian oil. This pattern is unexpected because Ordovician and Devonian reservoirs are physically separated by the Silurian strata. From time-temperature considerations, the Devonian oil probably was formed in older strata and has migrated to tist present location. Our analyses suggest a common source for the Devonian and Ordovician oils (Author)

A82-17632 # Characteristics of vertical wind profiles. B. H. Bailey (New York, State University, Albany, NY). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 49-54. 10 refs. Research supported by the New York State Energy Research and Development Authority.

Results of vertical wind profile studies of four sites with similar surface roughness lengths in New York state are reported. Anemometry at several levels supplied 20 sec, one minute, and 15 minute interval readings covering 1-2 yr. Average power law coefficients for all sites were determined for different stability classes, i.e. lapse rate intervals expressing temperature changes with heights. Diurnal characteristics were determined as stable conditions dominating during the night while neutral and unstable conditions dominate during the day, when higher winds were measured. The power law coefficients were therefore large at night and low in daytime. Similarities in the power law coefficients are taken as evidence that vertical wind profile characteristics are not necessarily site specific, and the 1/6 or 1/7 power law is adequate in wind regimes of 7 m/sec or greater.

A82-17645 # Wind energy and the Nation's rural electric systems. W. Prichett, III (National Rural Electric Cooperative Association, Washington, DC). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 144-149.

A82-17974 The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres. D. L. Douglass

04 FUELS AND OTHER SOURCES OF ENERGY

(California, University, Los Angeles, CA), V'. S. Bhide (IBM Corp., San Jose, CA), and E. Vineberg (Climax Molybdenum Co., Ann Arbor, MI). Oxidation of Metals, vol. 16, Aug. 1981, p. 29-79. 7 refs.

A82-18114 Biomass conversion processes for energy and fuels. Edited by S. S. Sofer (Oklahoma University, Norman, OK) and O. R. Zaborsky (NSF, Washington, DC). New York, Plenum Press, 1981, 434 p. \$49.50.

The book treats biomass sources, promising processes for the conversion of biomass into energy and fuels, and the technical and economic considerations in biomass conversion. Sources of biomass examined include crop residues and municipal, animal and industrial wastes, agricultural and forestry residues, aquatic biomass, marine biomass and silvicultural energy farms. Processes for biomass energy and fuel conversion by direct combustion (the Andco-Torrax system), thermochemical conversion (flash pyrolysis, carboxylolysis, pyrolysis, Purox process, gasification and syngas recycling) and biochemical conversion (anaerobic digestion, methanogenesis and ethanol fermentation) are discussed, and mass and energy balances are presented for each system.

A.L.W.

A82-18122 Alternate fuels; Proceedings of the International Congress and Exposition, Detroit, MI, February 23-27, 1981. Congress and Exposition sponsored by the Society of Automotive Engineers, Warrendale, PA, Society of Automotive Engineers, Inc. (SAE Proceedings SP-480), 1981. 255 p. \$24.95.

Alternative fuels for use in diesel engines are reviewed, and specific mention is made of multicylinder diesel engine tests with unstabilized water-in-fuel emulsions, fuel nitrogen conversion, performance, and emission characteristics of blended SRC-II in a high-speed diesel engine, and a diesel engine running on raw coal-diesel fuel slurries. Attention was also given to ethanol fuel in regards to efficiency and exhaust emissions, heavy duty truck operation on unstabilized methanol/diesel fuel emulsions, and the road performance of a diesel vehicle with a supplementary carburation of alcohol. The use of hydrogen fuels in automobiles is considered, along with onboard hydrogen generation for hydrogen injection into internal combustion engines, hydrogen fueled-vehicle testing to provide a data base, and liquid hydrogen onboard storage and servicing.

M.S.K.

N82-10115 Louisiana State Univ and A&M Coll, Baton Rouge METHANE PRODUCTION FROM ALKALINE FOOD WASTE Ph.D. Thesis

Wilson Thomas Gautreaux, Jr 1981 222 p Avail Univ Microfilms Order No 8117624

Because of waste generated by potato processing contained significant quantities of carbohydrate degradation products and sodium carbonate anaerobic digestion was determined to be a reliable process for waste treatment and methane production The high sodium levels did not inhibit anaerobic digestion at a substate concentration of 10 wt percent alkaline peel solids. In two-stage bench-scale studies at 37 C, methane production averaged 0.28 m cu/kg COD feed or 0.65 m cu/(m cu d) in a settled bacterial sludge methane fermenter with a 4 day retention time A pilot-scale anaerobic digestion system with a 154 m cu fermenter demonstrated the feasibility of a proposed anaerobic pond system for a food processing plant. With a 1.0 wt percent alkaline solids feed and a 9-day retention time, methane production averaged 0 16 m cu/kg solids or 0 18 m cu/m cu d) A process for single cell protein production via the acid stage of anaerobic digestion was explored Bacterial cell and protein yields of 0 18 and 0 09 kg/k glucose consumed were obtained at a retention time of four hours Dissert Abstr

N82-10141# If house instrict Chicag Dept 11 Properties Chicag Dept 12 Properties Chicag Dept 12

SEPARATION OF PARTICLES FROM COAL DERIVED LIQUIDS VIA SURFACE CHARGE PROPERTIES Final Report, Aug. 1977 - May 1981

Dimitri Gidaspow and Darsh Wasan Jul 1981 97 p refs

(Contract DE-AS02-77ET-10445) (DE81-029088. D0E/ET-10445/1) Avail NTIS

HC A05/MF A01

An improved method of removal of fine particles suspended in nonaqueous media by the application of a high-voltage (1000 to 10,000 V/cm) electric field was developed. The technique is a modification of ordinary cross-flow filtration with

a porous tube and of forced flow electrophoresis. The electrofilter was tested with a synthetic nonaqueous slurry as well as samples of diluted H-coal process liquids obtained from a coal liquefaction pilot plant at various electric field strengths, driving pressures, and feed rates. Models of clear boundary layers for flat and tubular cross-flow electrofilters were developed as a function of inlet Peclet number, electrophoretic velocity of particles, and rate of filtration.

N82-10143# State Univ of New York, Binghamton Dept of Chemistry

DESULFURIZATION WITH TRANSITION METAL CAT-ALYSTS Quarterly Technical Progress Report, 28 Mar. -Jun. 1981

John J Eisch 31 Jul 1981 4 p (Contract DE-AC22-79ET-14879) (DE81-028935. DOE/ET-14879/T6)

81-028935. DOE/ET-14879/T6) Avail NTIS

HC A02/MF A01

The reactivity and the intermediates in the desulfurization of 2-methyl dibenzo thiophene and certain model sulfides and sulfones were examined. The ratio of bis-1.5-cyclo octadiene nickel, the desulfurizing activity of soluble organo cobalt complexes, and the activity of aluminum hydride combinations with nickel (11), cobalt(11), and molybdenum(0) or molybdenum (IV) salts were also studied. Experimental procedures for applying these techniques to coal derived liquids were also addressed.

DOE

NTIS

N82-10144# Worcester Polytechnic Inst., Mass

KINETICS ÄND MECHANISMS OF CATALYTIC HYDROLIQ-UEFACTION AND HYDROGASIFICATION OF LIGNITE Quarterly Report, Apr. - Jun. 1981

Wilmer L Kranich, Kamel Guruz, and Alvin H Weiss 10 Aug 1981 24 p refs

(Contracts DE-FG22-81PC-40770, DE-AC22-77ET-10618) (DE81-023581, DOE/PC-40770/T2, QR-2) Avail NTIS HC AO2/MF A01

The variables involved in the hydroliquefaction and hydrogasification of lignite were studied. Emphasis was placed on the catalytic batch hydroliquefaction of a range of low rank coals including two subbituminous coals, four lignites, and leonardite, as well as cellulose. These were studied both as received and after partial demineralization by washing with hydrochloric acid.

N82-10148# Yale Univ, New Haven, Conn School of Medicine

DEVELOPMENT OF NEWER METHODS FOR THE ISOLATION AND IDENTIFICATION OF CERTAIN COMPONENTS FOUND IN COMPLEX MIXTURES DERIVED FROM ENERGY SOURCES AND THE DETERMINATION OF THEIR BIOLOGICAL ACTIVITY VIA BIOASSAY SYSTEMS Progress Report, Aug. 1980 - Jul. 1981

S R Lipsky Jul 1981 29 p refs Prepared in cooperation with LASL, N Mex

(Contract DE-AS02-76EV-02958)

(DE81-028311, DOE/EV-02958/T1) Avail

HC A03/MF A01

A composite sample of Paraho crude oil was fractionated and the fractions chemically identified by multidimensional gas chromatography. The fractions were then bioassayed to determine their biological activity.

N82-10150# Energy and Environmental Research Corp., Santa Ana. Calif

SOOT FORMATION IN SYNTHETIC FUEL DROPLETS
Quarterly Technical Progress Report, 1 Apr. - 30 Jun. 1981
G England, J Kramlich, Y Kwan, and R Payne Jul 1981
36 p

(Contract DE-AC22-80PC-30298)

(DE81-028391, DOE/PC-30298/T3, QRPR-3) Avail NTIS HC A03/MF A01

Fuel screening studies in the 70000 Btu/h tunnel furnace were extended to include SRC-11 middle and heavy distillate fuel oils A total of eight fuels were investigated. Soot, particulates, and NOx emission levels were obtained under comparable firing conditions for both normal and staged combustion, and at various overall excess air levels. The combustion of single-droplet streams was investigated in a controlled flow reactor. The trajectory of every SRC-11 fuel droplet was observed to determinate in a microexplosion. High speed photography showed this to be an extremely rapid event resulting in the formation of a visible.

luminous soot cloud. This behavior was not observed for a petroleum-derived No 6 oil and appeared to be pronounced for a blended SRC-11 than for either the middle or heavy distillate fuels Preliminary measurement were also made of local soot concentrations and of the temprature of the soot sheet in the reactor system

N82-10152# Air Products and Chemicals, Inc., Allentown, Pa CRYOGENIC METHANE SEPARATION/CATALYTIC HY-DROGASIFICATION PROCESS ANALYSIS Report

J Klosek Aug 1981 42 p (Contract DE-AC01-78ET-10325)

DOE/ET-10325/T11) (DE81-029123.

HC A03/MF A01

NTIS

Two commercial gasification processor were evaluated in terms of their relative effectiveness in separating methanes from the reaction products and some of the other synthesis gas products recycled Cryogenic methane separation results from the process gas recovered by partial condensation and carbon absorption are reported Preliminary plant designs for acid gas removal and cryogenic methane separation from the raw gas are also

N82-10153# Brookhaven National Lab., Upton, N Y FLAME-RETENTION HEAD BURNER EFFICIENCY TEST RESULTS AND ANALYSIS: SPACE-HEATING-EQUIPMENT TEST PROGRAM

R J McDonald and R F Krajewski Nov 1980 26 p refs (Contract DE-AC01-76CH-00016)

(DE81-030219, BNL-51321) Avail NTIS HC A03/MF A01 Fuel oil savings resulting from the use of flame-retention head burners in residential oil-fired hydronic heating units are summarized Results of laboratory and field tests are compared The fuel savings varied between 5 1% and 22 0% for various

N82-10154# New Hampshire Univ , Durham LIQUEFACTION OF BITUMINOUS COALS USING DIS-POSAL ORE CATALYSTS AND HYDROGEN Quarterly

Progress Report, 7 May - 7 Aug. 1981 V K Mathur Aug 1981 17 p (Contract DE-AC22-81PC-41035)

(DE81-029134, DOE/PC-41035/1) NTIS

HC A02/MF A01

Hydrogenation of coal-oil slurry by hydrogen using disposal ore catalysts (DOC) with special reference to maximizing liquefaction and minimizing viscosity of product oil was studied A number of companies were contacted to collect samples of ores and ore concentrates containing cobalt, molybdenum, nickel and other metals considered to posses catalytic activity and a commercial Co-Mo catalyst (0402T) are reported. These data are to be used as a base for evaluating the catalytic effects of the ores and minerals collected

N82-10155# Physical Sciences, Inc., Woburn, Mass SYNTHETIC-FUEL COMBUSTION; POLLUTANT FORMA-TION. SOOT-INITIATION MECHANISMS IN BURNING

AROMATICS Quarterly Report, 1 Apr. - 30 Jun. 1981 T Tanzawa, S P Schertzer, and W T Rawlins 1981 21 p refs

(Contract DE-AC22-80PC-30292)

(DE81-029480, DOE/PC-30292/3, PSI-TR-284, QR-3) Avail NTIS HC A02/MF A01

Toluene pyrolysis experiments were performed using He-Ne laser beam attenuation to monitor soot. The experimental results were consistent with those of previous investigators, however, the laser beam attenuation records showed an anomalously large absorption at the higher temperatures where soot formation should be minimal. This effect could be due to some light-absorbing gas-phase species such as PCAH and/or radicals of PCAH Diagnostics employed show ambiguous late-time behavior of the pressure, density, and beam attenuation profiles

N82-10156# Argonne National Lab , III CYCLONE PERFORMANCE ESTIMATES FOR PRESSURIZED FLUIDIZED-BED COMBUSTION

R F Henry and W F Podolski Jul 1981 33 p refs (Contract W-31-109-eng-38)

(DE81-028504. ANL/CEN/FE-81-4) NTIS Avail HC A03/MF A01

04 FUELS AND OTHER SOURCES OF ENERGY

Hot pressurized flue gas from pressurized fluidized-bed combustion must be cleaned up prior to its expansion in a gas turbine as part of the combined-cycle electric power generation concept. The performance of conventional cyclones in experimental tests has been compared with theory, with reasonable agreement Prediction of the performance of a larger cyclone system shows that three stages should provide the cleanup required on the basis of current estimates of turbine tolerance of particulate matter Advances in hot gas cleanup - optimized cyclones, augmented cyclones, and alternative devices should provide future improvement in cycle efficiencies and costs, but simple cyclones are planned for first-generation PFB/CC pilot and demonstration

N82-10157# Spectron Development Labs , Inc , Costa Mesa. Calif

PARTICULATE PROCESSES IN PULVERIZED-COAL FLAMES Quarterly Technical Progress Report, Jan. - Mar. 1981

Apr 1981 65 p refs (Contract DE-AC22-80PC-30300)

(DE81-025153. DOE/PC-30300/T3) NTIS

HC A04/MF A01

The design of the entire apparatus for the dilute particle reaction experiment was completed. This includes two reactor heads, a fluidized bed feeder, the tube reactor, and the reactor traverse mechanism Experimental observations of ignition and devolatilization of Pittsburgh Seam HVA bituminous coal were initiated Observations using both front and back light pulsed laser holography and particle sizing interferometry were made Preliminary analysis of the data indicate that high quality results can be obtained

N82-10158# Physical Sciences, Inc., Woburn, Mass PULVERIZED-FUEL COMBUSTION: MODELING AND SCALEUP METHODOLOGIES Quarterly Report, 1 Apr. -30 Jun. 1981

Paul F Lewis, Evan R Pugh, Neison H Kemp, Alan Gelb, and Thomas Wolf Aug 1981 30 p refs (Contract DE-AC22-80PC-30294, QR-3)

(DE81-026546, DOE/PC-30294/3, PSI-TR-280) Avail NTIS HC A03/MF A01

Effort this quarter has continued on model improvements, and the data analysis task has begun. Specific work reported includes model of the heterogeneous reactions of coal chars. work on particle-particle collisions, improvements in the computer code to handle the stiff nature of the particle momentum and energy equations, and identification of a set of experiments with which to start the data analysis. Results of these efforts are a model for heterogeneous carbon reactions including OH and O reactions, a model for collisional drag effects, improved numerical stability of the code, and beginning of data analysis

N82-10201# Idaho National Engineering Lab , Idaho Falls CORROSION TESTING OF CARBON STEEL IN AEREATED GEOTHERMAL BRINE

D F Suciu and P M Wikoff Idaho Falls, Idaho Edgerton, Germeshausen and Grier, Inc. Feb. 1981 55 p. refs. (Contract DE-AC07-76ID-01570)

(DE81-028653. EGG-GTH-5474)

NTIS Avail

HC A04/MF A01

Two major problems are associated with the use of cooled geothermal water as coolant for the 5 MW(e) Pilot Power Plant and Raft River are a scaling potential owing to the chemical species present in solution, and the corrosive nature of the geothermal water on carbon steels. A water treatment test program was established to reduce or eliminate these problems Data show that scale can be prevented by a combination of dispersants and controlling the concentration of scaling species in the circulating water. Corrosion cannot be controlled without a pretreatment of tubing material. With the pretreatment, a protective gamma iron oxide film is laid down on the tube surface, that with proper corrosion inhibitor additives, significantly reduces both general and pitting corrosion. However, longer term testing is required to determine protection of pitting corrosion

N82-10249# North Dakota Univ. Grand Forks CHEMISTRY OF LIGNITE LIQUEFACTION Quarterly Report, Apr. - Jun. 1981

R J Baltisberger, Virgil I Stenberg, Kenneth J Klabunde, and Neil F Woolsey Jul 1981 55 p refs

04 FUELS AND OTHER SOURCES OF ENERGY

(Contract DE-AB18-78FC-02101) (DF81-030178

DOE/FC-02101/18) Avail NTIS

HC A04/MF A01

Progress reports are presented for structural studies of lignite derived asphaltene and preasphaltenes and ether cleavage studies Reports of denitrogenation caused by CO and water reactions and of electron transfer catalysis studies are also presented Results indicate that the major differences between asphaltenes and preasphaltenes is that the molecular weight maximizes near 1500 g/mol for the preasphaltenes compared to 400 g/mol for the asphaltenes It is further indicated that asphaltenes have little or no aliphatic or anyl aliphatic ethers whereas preasphaltenes have significant amounts. Other significant results are reported

N82-10250# Department of Energy, Bartlesville, Okla Energy Technology Center

LIQUID FOSSIL FUEL TECHNOLOGY Quarterly Technical Progress Report, Oct. - Dec. 1980

May 1981 77 p refs

(DE81-029912. DOE/BETC/QPR-80/4) NTIS Avail

HC A05/MF A01

Highlights of research activities at BETC during the past quarter are summarized. Major research areas include. liquid fossil fuel cycle, extraction (resource assessment and enhaned producton), processing (characterization, thermodynamics, and process technology), utilization, and product integration and technology transfer

N82-10251# Rockwell International Corp., Canoga Park, Calif. Energy Systems Group.

MOLTEN-SALT COAL-GASIFICATION PROCESS DEVELOP-MENT UNIT, PHASE 2 Quarterly Technical Progress Report, Jan. - Mar. 1981

M. H Slater 20 Apr 1981 57 p refs (Contract DE-AC21-77ET-10296)

(DE81-023585; DOE/ET-10296/T2, ESG-DOE-13363, QTPR-3) Avail NTIS HC A04/MF A01

Run 7, the second run of the Phase 2 program, was completed The gasification system was operated for a total of 169 h at pressures up to 90 psig. Average product gas HHV values of 81 Btu/scf were recorded during 90-psig operation, while gasifying coal at a rate of 735 lb/h. The run was terminated, as planned, after 7 full days of operation Prior to Run 7, an 80% cobalt-20% chromium alloy metal melt withdrawal orifice was installed as a replacement for a high-purity alumina orifice which had cracked during Run 6, and thus, it is suspected, contributed to the overflow system plug which prematurely terminated the test. The new metal orifice survived the entire Run 7 campaign virtually

N82-10253# Westinghouse Electric Corp., Concordville, Pa BASELINE DATA ON UTILIZATION OF LOW-GRADE FUELS IN GAS TURBINE APPLICATIONS. VOLUME 2: HOT COMPONENT CORROSION EVALUATION Final Report J J Vitello and S T Scheirer Jun 1981 64 p Sponsored in part by Electric Power Research Inst

(EPRI Proj 1079-2) (DE81-903760,

EPRI-AP-1882-Vol-2) NTIS Avail

HC A04/MF A01

The corrosion of turbine parts when operated with residual oil versus distillate oil was compared. A metallographic evaluation of combustion turbine hot components, which showed partial residual versus total distillate fuel firing, revealed no discernable differences in component degradation (hot corrosion). Considering the time of operation, the degree of hot corrosion observed was somewhat greater than expected for oil-fired combustion turbines of similar designs and alloy selections. This abnormality was attributed to the ingestion of high levels of sodium contaminated mist from the adjacent cooling tower hrough the turbine compressor inlet. Corrosion due to vanadium compounds in the heavy fuel machines was practically nil, which indicates that residual fuel is satisfactory for use in combustion turbine plants

N82-10255# Gulf Research and Development Co., Pittsburgh,

UNDERGROUND GASIFICATION OF STEEPLY DIPPING BEDS. PHASE 2 REPORT: RESULTS OF RAWLINS TEST NO. 1 Final Report, 1 Mar. 1978 - 1 Mar. 1980

Jul 1981 271 p refs Prepared in cooperation with TRW

Energy Systems Planning Div. McLean, Va (Contract DE-AC03-77ET-13108) (DE81-028581. DOE/ET-13108/T14) NTIS Avail HC A12/MF A01

A 23 ft thick coal bed dipping at 63 deg was used to test the feasibility of using underground coal gasification techniques to extract energy from steeply dipping coal beds (UCG-SDB) The coal was ignited at a vertical depth of 400 ft utilizing a directionally drilled process well pair. The heating value of the product gas during the 21 day air injection phase initially climbed to approximately 180 Btu/SCF and gradually declined to the 120 to 130 Btu/SCF range Air injection rates of 1600 to 2000 SCFM were used, and wet product gas rates between 3000 and 4500 SCFM were obtained A 5 day steam/oxygen injection test was also conducted which increased the product gas heating value to the 220 to 260 Btu/SCF range. The environmental studies concentrated on ground water quality, air quality, surface subsidence, and personnel industrial hygiene

N82-10257# Bell Aerospace Co., Buffalo, N. Y. HIGH-MASS-FLUX COAL GASIFIER Final Report A J Simpkin May 1981 102 p refs (Contract DE-AC01-79ET-14674) (DE81-029807 DOE/ET-14674/16)

HC A06/MF A01

NTIS Avail

This report describes the design, analysis, construction, and test activities associated with bringing a short residence time, entrained flow gasifier process development unit (PDU) to operational status are described. The basic high mass flux (HMF) gasifier, incorporated in the PDU, operates at a coal through-put of twelve tons per day, a pressure of fifteen atmospheres and processes coal, oxygen and steam to produce a synthesis. When applied to the production of substitute natural gas, the option exists to add secondary coal to the basic HMF gasifier, for the purpose of enhancing the methane content of the product A secondary coal feed system was developed and its injection capability demonstrated in a cold flow test facility Operability and performance of the synthesis gas stage of the HMF gasifier were demonstrated with Pittsburgh seam coal and North Dakota Lignite Curtailment of testing precluded the conduct of any gasification tests with secondary coal injection. Included in the main program was a task to evaluate the effects of slag fluxing additives upon viscosity/temperature relationships for Pittsburgh seal coal slags DÕE

N82-10259# General Electric Co., St. Petersburg, Fla. Corporate Research and Development

EXPERIMENTAL EVALUATION OF THE STEADY-STATE AND DYNAMIC PERFORMANCE CHARACTERISTICS OF THE INTERACTIVE UNITS OF A COAL-GASIFICATION PROCESS Quarterly Report, 28 Dec. 1980 - 29 Mar. 1981 J C. Corman Apr 1981 75 p refs (Contract DE-AC01-80ET-14928)

(DE81-028995; DOE/ET-14928/1) Avail. NTIS

HC A04/MF A01

The technology base required to premit coal conversion systems to operate within the constraints imposed by end use applications was investigated. A series of unfired dynamic tests along with fired steady state tests were defined. Thermal decomposition of ammonia was investigated. High conversion rates were observed for binary NH3/H2 gas mixtures. Conversion was found to be thermodynamically limited when substantial H2 and N2 concentrations are present. The overall structure of the IGCC mathematical model has been developed and information flow reqirements associated with each component in the model were defined. The computer model for the gasifier and the first water quench were completed

N82-10260# Hydrocarbon Research, Inc., Lawrenceville, N. J. H-COAL PROCESS IMPROVEMENT STUDY. BENCH UNIT BASELINE RUN WITH PREHEATER/REACTOR May 1981 56 p

(Contract DE-AC05-77ET-10152)

(DE81-026022, DOE/ET-10152/T6, FE-10152-65) Avail-NTIS HC A04/MF A01

The thermal dissolution of coal and its effects on the mechanism of coal liquefaction in an H-coal system is investigated The two-stage coal liquefaction system consists of a coal slurry preheater which is essentially a short residence time reactor and a liquefaction reactor which can be regarded as a catalytichydrogenation-reactor. The preheater design and unit modifications are discussed Results of the run to obtain baseline data with the preheater integrated in the bench unit system are compared with those of previous bench runs at similar operating conditions without a preheater, and also to previous PDU operations at similar conditions These comparisons were made to determine what effect a preheater has on product yields and product quality It is concluded that a preheater tends to increase heavy liquid yields with more residual oil and a higher proportion of heavy distillates in the distillate product DOF

N82-10262# Aluminum Co of America, Pittsburgh, Pa PULVERIZED-COAL FIRING OF ALUMINUM MELTING FURNACES Quarterly Technical Progress Report, 1 Oct. -31 Dec. 1979

C E West Oct 1980 56 p refs (Contract DE-AC01-78CS-40037)

(DOE/CS-40037/T2) Avail NTIS HC A04/MF A01

Progress is reported on the demonstration program of an efficient, environmentally acceptable coal firing process suitable for implementation on melting furnaces in the aluminum industry Specific tasks reported on are design of burner A, process equipment design and layout, purchase of process equipment, and fabrication of burner A. The status report on phase I data deliverable and a cost summary are presented

N82-10263# Midwest Research Inst., Golden, Colo Solar Energy Information Data Bank ALCOHOL FUELS BIBLIOGRAPHY, 1901 - MARCH 1980 Apr 1981 468 p (Contract DE-AC02-77CH-00178) NTIS

(DE81-025482, SERI/SP-751-902) Avail HC A20/MF A01

This annotated bibliography is subdivided by subjects, as follows general, feedstocks-sugar, feedstocks-starch, feedstockscellulose crops and residues, productions, coproducts, economics, use as vehicle fuel, government policies, and environmental effects

N82-10264# California Univ , Berkeley Lawrence Berkeley Lab Materials and Molecular Research Div

CHEMISTRY AND MORPHOLOGY OF COAL LIQUEFACTION Quarterly Report, 1 Jan. - 30 Mar. 1981 Heinz Heinemann Mar 1981 20 p (Contract W-7405-eng-48)

(DE81-028899, LBL-12933) Avail NTIS HC A02/MF A01

A novel cobalt mediated, reversible cleavage of a vinylhydrogen bond was discovered All products from the thermal decomposition of tetralin were identified. The stereochemistry of cis-1, 2 dihydrotetralin was determined in the utilization of the water gas shift reaction as a reducing agent for model coal compounds it was found that tributylphosphine ligands increase the life of transition metal hydride catalysts. Rates of demetallation of high metal content gas oils over cobalt-molybdena-alumina catalysts were measured for vanadium and iron. It is clearly shown that pore plugging of the catalyst occurs early and results in deposition of the metals on the external catalyst surface DOE

N82-10267# Argonne National Lab , III Energy and Environmental Systems Div

ENHANCEMENT OF METHANE GAS PRODUCTION USING AN INDUSTRIAL WASTE IN ANAEROBIC DIGESTION

L Fradkin and F Kremer (ESCOR, Inc.) 1980 10 p Presented at the 3rd Miami Intern Conf on Alternative Energy Sources, Fla , 15-18 Dec 1980 (Contract W-31-109-eng-38)

(DE81-023819, CONF-801210-26) NTIS

HC A02/MF A01

Chrominum can block enzymatic systems or interfere with essential cellular metabolites of most oxidizing bacteria. In general, heavy metals coagulate and precipitate proteins, many of which are denatured by this action. The effects on anaerobic digestion of chromium shavings from leather tanning were examined Leather chrome shavings (which contain proteins, nitrogen, and fats) were added to two of three digesters at various rates. The methane gas production of the experimental units improved significantly compared to the control. In addition, the presence of a toxic loading or change of feed had no harmful effect on the digester performance DOE

N82-10268# Mound Lab , Miamisburg, Ohio PRICETOWN 1 UNDERGROUND COAL GASIFICATION

04 FUELS AND OTHER SOURCES OF ENERGY

FIELD TEST: OPERATIONS REPORT

A K Agarwal and R E Zielinski 1981 269 p refs

(Contract DE-AC04-76DP-00053)

(DE81-025162. MLM-MU-81-62-0007) NTIS HC A12/MF A01

An Underground Coal Gasification (UCG) field test in bituminous coal was successfully completed near Pricetown, West Virginia The viability of the linked vertical well (LVV) technology to recover the 900 foot deep, 6 foot thick coal seam was determined. A methane rich product gas with an average heating value of approximately 250 Btu/SCF was produced at low air injection flow rates during the reverse combustion linkage phase Heating value of the gas produced during linkage enhancement phase was 221 Btu/SCF with air injection. The high methane formation was attributed to the thermal and hydrocracking of tars and oils along with hydropyrolysis and hydrogasification of coal char The high heating value of the gas was the combined effect of residence time, flow pattern, injection flow rate, injection pressure, and back pressure. During the gasification phase, a gas with an average heating value of 125 Btu/SCF was produced with only air injection, which resulted in an average energy production of 362 MBtu/day

N82-10269# Aerojet Energy Conservation Co., Sacramento, Calif STUDY OF GELLED LNG Final Technical Report

M I Rudnicki, J A Cabeal, L C Hoffman, R A Newton, R K Schaplowsky, and E M VanderWall May 1981 110 p (Contract DE-AC03-80SF-10846)

(DE81-023259. DOE/TIC-11452) NTIS Avail

HC A06/MF A01

Progress is reported in the following areas characterization of gelled LNG (GELNG) rheological properties, assessment of the relative leakage of GELNG vs LNG through a perforated wall, relative spread and vaporization rates of unconfined spills on water, and relative spread and vaporization rates of unconfined spills on land. Shear stress vs strain rate was determined for a range of gelant concentrations. The shear diagram was extended to cover shear rates in the range of 13 to 14,800 inverse seconds, expanding previous results at both low and high shear rates Leakage tests of GELNG through a known geometry perforation were conducted along with comparative testing with LNG Rapid cessation of flow through the perforated plate was observed for all tested concentrations of GELNG and at all driving pressures Land spills were found to give inconclusive results due to difficulties in measuring transient weight changes during the spill Gelatin increases total vaporization time significantly in water

N82-10271# Council for Scientific and Industrial Research, Pretoria (South Africa) Chemical Engineering Group SELECTIVITY IN FISCHER-TROPSCH SYNTHESIS: REVIEW AND RECOMMENDATIONS FOR FURTHER WORK

L Caldwell Jun 1980 42 p refs , (PRR1-223596, CSIR-SR-CHNG-330)

NTIS HC A03/MF A01 CSCL 21D

A broad product spectrum is obtained from the Fischer-Tropsch synthesis aimed at the production of gasoline and diesel fuels. This is a consequence of the carbon atom by carbon atom mechanism of chain growth. There is potential for narrowing the product spectrum by use of dual-function catalysts or transient process conditions

N82-10272# Battelle Pacific Northwest Labs , Richland, Wash KINETICS AND CATALYSIS OF PRODUCING SYNTHETIC GASES FROM BIOMASS Annual Report, 7 Dec. 1979 -6 Dec. 1980

L J Sealock, Jr, D C Elliott, S L Weber, and R J Robertus Jan 1981 129 p refs

(Contract GRI-5014-361-0242)

(PB81-217614, GRI-79-0100) Avail NTIS HC A07/MF A01 CSCL 21D

The kinetics, reaction sequences, and pathways involved in pyrolysis and catalytic steam gasification of wood and wood components were investigated. An autoclave and a batch reactor were used to study gasification at low temperature and high temperature regimes. Kinetic studies of the carbon steam reaction relative to cellulose and lightning gasification were completed Reaction rate constants and activation energies were determined for three catalyzed cases and for a noncatalyzed case. The formation of specific compounds during gasification in the presence and absence of catalyst was investigated in both reactor systems Results of the experiments demonstrate dramatic effects on the

04 FUELS AND OTHER SOURCES OF ENERGY

kinetics and gas composition as a function of the various catalyst and catalyst concentrations tested

N82-10275# Air Products and Chemicals, Inc., Trexlertown,

LOAD-CHANGE TESTING OF A LARGE COMMERCIAL **OXYGEN PLANT** Final Report

N Chatterjee, J C Sorensen, and A J Patrylak Apr 1981 46 p refs (EPRI Proj 2806-1)

(EPRI-NP-1824) Avail NTIS HC A03/MF A01

A series of transient response tests were successfully conducted on one of three 1,000 T/D oxygen production plants operated under computer control. These tests involved a series of rapid rate changes in oxygen production specified to simulate the varying demand for oxygen of a coal gasifier in combined cycle power generation service. Since the ability of the oxygen plant itself to rapidly change its gaseous production rate is an important element in the design and operation of gasification combined cycle) plants, a series of load following tests was arranged. The actual oxygen plant rate changes easily exceeded the targeted response rate with minimal variation in product oxygen purity Oxygen production rate changes of +- 10 to +-13% of design in 1 to 2 min were readily accomplished. The production rate was also varied over the full range from 70% to 105% of design at a continuous ramp rate of approximately 2% of design production per minute

N82-10279# Ruhrkohle A.G., Essen (West Germany) SAFETY AND TECHNICAL OPTIMIZATION OF BELT TRANSFER POINTS WITH SPECIAL CONSIDERATION FOR THE SUPPRESSION OF NOXIOUS AND EXPLOSIVE DUSTS Final Report

Albert Schade Bonn Bundesministerium fuer Forschung und Technologie Dec 1980 71 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-HA-80-048, ISSN-0171-7618) Avail HC A04/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 14,90

A dust suppression installation and a dust monitoring instrument were laboratory tested and installed at belt transfer points in a coal plant where noxious and explosive dust develops by air separation, leading to considerable increases of concentration in subsequent operational areas. Usage of enclosed segment chutes is shown to reduce the dust load by 40% A digital scattered light photometer in connection with a signal-controlled sprinkler installation lead to further dust diminution along with a reduction of the spray water volume by 30 to 50% Generalization of usage of the present installation is advocated

Author (ESA)

N82-10366# Brown Univ , Providence, R I Div of Engineer-

FLOW IN GEOTHERMAL WELLS. PART 4: TRANSITION CRITERIA FOR TWO-PHASE FLOW PATTERNS

Z Bilicki and J Kestin Dec 1980 22 p refs (Contract DE-AC02-79ET-27225)

(DE81-028312. DOE/ET-27225/9) NTIS Avail HC A02/MF A01

Detailed considerations justifying the criteria for transitions between flow patterns are presented. The following are covered. transition from bubble to plug (or slug) flow, transition from plug flow to froth flow, transition from froth to annular mist flow, and model comparisons DOF

N82-10474# Department of Energy, Washington, D C Energy Information Administration

VENEZUELA, TRINIDAD AND TOBAGO: CRUDE OIL POTENTIAL FROM KNOWN DEPOSITS

William D Dietzman, Naim R Rafidi, and Arthur J Warner Jul 1981 127 p refs (DE81-027023,

DOE/EIA-0297) NTIS

HC A07/MF A01

Estimates of original oil in place ultimate recovery, remaining reserves, and projected supply patterns are presented A discussion of the methodology for projecting supply patterns is also presented. The Republic of Venezuela ranked 7th in 1979 in production among the oil producers of the world and is one of the leading exporters of crude oil About 1/3 of the country's exports are received by the United States, and it was the 5th and 3rd largest supplier of crude oil and refined products to the United States in 1978 and 1979, respectively

N82-10475# Nevada Univ. Reno

LOW-TO-MODERATE TEMPERATURE GEOTHERMAL RESOURCE ASSESSMENT FOR NEVADA, AREA SPECIFIC STUDIES Final Report, 1 Jun. 1980 - 30 Aug. 1981

D T Trexler, B A Koenig, T Flynn, J L Bruce, and G Ghusn, 1981 223 p refs

(Contract DE-ACO8-79NV-10039)

(DE81-030487, DOE/NV-10039/3) Avail NTIS HC A10/MF A01

The Hawthorne study area encompasses approximately 310 sq km The energy needs of the military and the local population are substantial. The techniques employed in the resource assessment are described Geological and geophysical methods were used and the results are reported

N82-10477# Texas Univ, Austin Dept of Petroleum Engineering

TERTIARY OIL RECOVERY PROCESSES RESEARCH AT THE UNIVERSITY OF TEXAS Final Report, Oct. 1979 - Sep.

R S Schechter and W H Wade Jun 1981 135 p refs (Contract DE-AC19-78BC-20001)

(DE81-025222. NTIS DOE/BC-20001/10) Avail HC A07/MF A01

Surfactant adsorption, phase behavior, interfacial tension, and solubilization were examined Focus is on solubilization, 1FT, and phase behavior with the emphasis on the influence of branching for anionics and molecular weight for nonionics. Phase behavior is related to emulsion stability, polymeric surfactants, and salinity tolerant surfactants were evaluated

N82-10478# Oak Ridge National Lab, Tenn
ION EXCHANGE CHARACTERISTICS OF ENHANCED OIL RECOVERY SYSTEMS (MISCIBILITY STUDIES) Semiannual Report, 1 Apr. 1979 - 30 Sep. 1980

P C Ho, K A Kraus, T M Bender, and S B Ogden Jul 1981 59 p refs

(Contract W-7405-eng-26)

(DE81-769734. DOE/BETC/OR-19) NTIS HC A04/MF A01

During the report period (1) studies of the hydrotropic properties of organic alkylbenzenesulfonates and particularly of alkylbenzenecarboxylates were extended, (2) the effects of several different alcohols on miscibility between aqueous protosurfactant solutions and aliphatic and aromatic alkanes were investigated. (3) hydrotropic properties of an alicylic carboxylate were determined, (4) the equivalent weight of the organic salts studied was extended into the surfactant range, (5) solubilities of protosurfactants and surfactants in salt solution were measured, and (6) investigations of the adsorption of protosurfactants on minerals as a function of salinity were started Measurements include establishment of the phase behavior in the limiting three-component systems, the effect of protosurfactant concentration in the four-component systems, and determination of the compositions in a limited number of cases of the coexisting phases DOE

N82-10479# Argonne National Lab , III Land Reclamation

FRACTURE FLOW OF GROUNDWATER IN COAL-BEARING

Jeffrey P Schubert 1980 15 p refs Presented at 1980 Symp on Surface Mining Hydro, Sedimentology and Reclamation, Lexington, Ky, 1-5 Dec 1980

(Contract W-31-109-eng-38)

CONF-801263-1) (DE81-023810. HC A02/MF A01

Laboratory tests on core samples of sandstones, siltstones, shales, and claystones indicate extremely low intergranular hydraulic conductivities. Various aguifer tests, using wells in the same locations, invariably showed hydraulic conductivities to be much greater than those estimated by laboratory techniques. In addition the hydraulic conductivity of highly fractured rock can be 100 to 1,000 times greater than slightly fractured rock. The greatest concentration of fractures usually occurs in faulted areas and in narrow fracture zones less than 100 m below ground surface. The majority of large inflows through rock into surface and underground mines occur at the faults and fracture zones By studying and understanding more about the structural control

of fractures in coal basins the larger inflows possibly could be

N82-10480# Los Alamos Scientific Lab , N Mex DEVELOPMENT OF MAN-MADE GEOTHERMAL RESER-VOIRS

Roland A Pettitt 1981 9 p Presented at the Energy in the Man-Built Environment The Next Decade Specialty Conf., Vail. Calo 3-5 Aug 1981

(Contract W-7405-eng-36)

(LA-UR-81-852) Avail NTIS HC A02/MF A01

The technology used to create and extract heat from a geothermal reservoir in low porosity, granitic basement rock in at the Fenton Hill site in northern New Mexico is described Topics covered include drilling boreholes, injecting potable water as the working fluid, hydraulic fracture to provide the large surface area need for heat exchange the mechanics of reservoir growth, make-up water requirements, geofluid chemistry, electrical generation, operational constraints, and effects on the environ-

N82-10482# Bundesanstalt fuer Geowissenschaften und Rohstoffe, Hannover (West Germany) DEVELOPMENT OF ORGANIC GEOCHEMICAL AND ISOTOPE TECHNIQUES FOR HYDROCARBON EXPLORA-**TION Final Report**

Eckhard Faber, Heinz Hufnagel, Helmut Jacob, Joachim Kock, Wolfgang Stahl, Manfred Teschener, and Hermann Wehner Bonn Bundesministerium fuer Forschung und Technologie Oct 1980 55 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie (BMFT-FB-T-80-076, ISSN-0340-7608) Avail . NTIS HC A04/MF A01, Fachinformationszentrum, Karlsruhe, West

Germany DM 11,55

Sedimentary organic matters was characterized by correlating microscopic and chemical data. Techniques for oil-oil and oil-source rock correlations were developed using the distribution of polycyclic aromatic hydrocarbons. It is shown that the carbon isotopic composition of oils, extracts and kerogens. The C12/C13 ratios of methane from different natural gases were correllated with the maturity of their source rocks. The C13/C12 ratios of methane from cuttings were also determined. Results show that pyrolysis chromatograms reflect the type of organic matter Fluorescence of dinoflagellates is directly related to maturity Bitumens are classified by fluorescence microscopy Correlation of crude oils is performed using chromatograms of the aromatic fraction of crudes Gas-source rock correlation is feasible by a systematic correlation of delta values of methane and the maturity of the source organic matter Isotope analyses of head-space gases are developed for active exploration

Author (ESA)

N82-10560# Los Alamos Scientific Lab , N Mex HOT DRY ROCK GEOTHERMAL ENERGY DEVELOPMENT PROGRAM Progress Report

Paul R Franke 1981 17 p Conf., Atlanta, 19 Aug 1981 refs Presented at the IECEC

(Contract W-7405-eng-36)

(LA-UR-81-1265, CONF-810812-11) NTIS HC A02/MF A01

A hot dry rock geothermal system was developed from a reservoir created by hydraulic fracturing. A reservoir of sufficient size and capacity was confirmed and two extraction runs were made. The thermal drawdown data indicate that the effective heat area is increased. The reservoir enlargement is confirmed by gradual thermal drawdown, and the effective heat transfer area of the reservoir is increased

N82-10655# Pacific Northwest Lab , Richland, Wash spheric Sciences Dept

ANALYSIS OF DATA FROM THE US DEPARTMENT OF ENERGY'S METEOROLOGICAL VALIDATION PROGRAM William F Sandusky and John W Buck Jun 1981 19 p refs Presented at the Pacific Div, Am Assoc for the Advan of Sci Ann Meeting, Richland, Wash, 15-18 Jun 1981 (Contract DE-AC06-76RL-01830)

(DE81-030100, PNL-SA-9411, CONF-8106152-1) Avail

NTIS HC A02/MF A01 The history of the meteorological validation program (MVP) and its unique features of the summarized data for candidate

sites are described. Available wind power for each site and the projected power for a MOD-2 turbine at each site is provided

04 FUELS AND OTHER SOURCES OF ENERGY

Wind power data are compared to data from the resource assessment program to locate areas of high wind energy potential in the contiguous United States, Alaska and Puerto Rico The effect of data recording techniques and averaging period of the data on Weibull distribution parameters are included

N82-10735# British Gas Corp , Newcastle-upon-Tyne (England) Engineering Research Station

MICROPROCESSOR APPLICATIONS FOR THE MONITOR-ING AND CONTROL OF GAS SUPPLIES

R S Davidson and T M Sporton Nov 1980 11 p Presented at IMEKO/IFAC Symp on Appl of Microprocessors in Devices for Instrumentation and Automatic Control, London, 17-20 Nov

(ERS-E-276) Avail NTIS HC A02/MF A01

The potential of the microprocessor to replace many established electromechanical and pneumatic systems and to solve problems which could be tackled previously only by main-frame computers is discussed Applications already in use and ideas under development are detailed. These include telemetry systems used for controlling and monitoring gas supplies, controlling the monitoring of a reversible liquid natural gas process for meeting peak demand on a seasonal basis, a system incorporating a microprocessor for gas holder monitoring and control, and a prototype microprocessor control system for gas distribution governors Author (ESA)

N82-10938# Battelle Columbus Labs, Ohio THERMOPHYSICAL PROPERTIES OF COAL LIQUIDS Quarterly Technical Status Report, 1 Apr. - 30 Jun. 1981 J W Droege, R Venkateswar, and S P Chauhan 17 Jul 1981 40 p (Contract DE-AC22-79ET-14941)

(DE81-0279446, BMI-2086. QTSR-7) NTIS Avail HC A03/MF A01

The rheological properties of coarse coal which grind at relatively low temperature (450 K) showed a substantially lower viscosity It is also shown that coal and solvent from a plant give slurries of much higher viscosity than slurries from reference coal and solvent. The same relationships are shown at higher temperatures. The effect of solvent to coal ratio is also very great Differential scanning calorimetry give low reliability specific heat results and a probable heat effect at about 500 K is shown

N82-10939# Colorado School of Mines, Golden
ENTHALPY MEASUREMENT OF COAL-DERIVED LIQUIDS Technical Progress Report, May - Jun. 1981
A J Kidnay and V F Yesavage 15 Jul 1981 14 p

(Contract DE-AC22-81PC-40787)

(DE81-029481.

DOE/PC-40787/1)

HC A02/MF A01

Enthalpy for coal derived liquids on the model compound quinoline was measured Compounds over the pressure and temperature and temperature regions encountered in liquification and processing systems were modeled Preliminary results are presented for the temperature region 186 to 7320 F along isobars of 75, 100, and 200 psia

NTIS

N82-11144* National Aeronautics and Space Administration Pasadena Office, Calif

FLUIDIZED BED COAL COMBUSTION REACTOR Patent Philip I Moynihan (JPL, California Inst. of Technology, Pasadena) and Donald L Young, inventors (to NASA) (JPL, California Inst of Technology Pasadena) Issued 8 Sep 1981 7 p Filed 15 Dec 1978 Supersedes N79-14388 (17 - 05, 0601) Sponsored by NASA

(NASA-Case-NPO-14273-1, US-Patent-4,287,838, US-Patent-Appl-SN-969759, US-Patent-Class-110-234, US-Patent-Class-110-255, US-Patent-Class-110-266,

US-Patent-Class-110-245, US-Patent-Class-122-4D) Avail US

Patent and Trademark Office CSCL 21B

A fluidized bed coal reactor includes a combination nozzleinjector ash-removal unit formed by a grid of closely spaced open channels, each containing a worm screw conveyor, which function as continuous ash removal troughs. A pressurized air-coal mixture is introduced below the unit and is injected through the elongated nozzles formed by the spaces between the channels The ash build-up in the troughs protects the worm screw conveyors as does the cooling action of the injected mixture. The ash layer and the pressure from the injectors support a fluidized flame combustion zone above the grid which heats water in

boiler tubes disposed within and/or above the combustion zone and/or within the walls of the reactor

Official Gazette of the U.S. Patent and Trademark Office

N82-11145*# Jet Propulsion Lab., California Inst. of Tech., Pasadena

COAL DESULFURIZATION BY LOW TEMPERATURE CHLORINOLYSIS, PHASE 3 Technical Report, 1 Mar. 1980 - 1 Mar. 1981

John Kalvinskas, Naresh Rohatgi, and John Ernest 1 Mar 1981 170 p refs Sponsored by NASA (Contract DE-AI01-77ET-12547)

(NASA-CR-164957, JPL-Pub-81-82, DOE/ET-12547/1) Avail NTIS HC A08/MF A01 CSCL 07D

Laboratory scale, bench scale batch reactor, and minipilot plant tests were conducted on 22 bituminous, subbituminous, and lignite coals. Chemical pretreatment and post treatment of coals relative to the chlorination were tried as a means of enhancing desulfurization by the chlorinolysis process. Elevated temperature (500-700 C) hydrogen treatment of chlorinolysisprocessed coal at atmospheric pressure was found to substantially increase coal desulfurization up to 90 percent Sulfur forms, proximate and ultimate analyses of the processed coal are included Minipilot plant operation indicates that the continuous flow reactor provides coal desulfurization results comparable to those obtained in the batch reactor. Seven runs were conducted at coal feed rates of 1 5 to 8 8 kg per hour using water and methylchloroform solvents, gaseous chlorine feed of 3 to 314 SCFH at 21 to 70 C, and atmospheric pressure for retention times of 20 to 120 minutes

N82-11146*# Jet Propulsion Lab., California Inst. of Tech., Pasadena

ASSESSMENT OF ADVANCED COAL GASIFICATION **PROCESSES**

John McCarthy, Joseph Ferrall, Thomas Charng, and John Houseman Jun 1981 200 p refs Sponsored in part by DOE and JPL

(Contracts NAS7-100, DE-AI21-77ET-13032, JPL Proj

(NASA-CR-164949, JPL-Pub-81-45, DOE/ET-13032/2) Avail NTIS HC A09/MF A01 CSCL 07D

A technical assessment of the following advanced coal gasification processes is presented high throughput gasification (HTG) process, single stage high mass flux (HMF) processes. (CS/R) hydrogasification process and the catalytic coal gasification (CCG) process Each process is evaluated for its potential to produce synthetic natural gas from a bituminous coal. Key similarities, differences, strengths, weaknesses, and potential improvements to each process are identified. The HTG and the HMF gasifiers share similarities with respect to short residence time (SRT), high throughput rate, slagging, and syngas as the initial raw product gas. The CS/R hydrogasifier is also SRT, but is nonslagging and produces a raw gas high in methane content The CCG gasifier is a long residence time, catalytic, fluidbed reactor producing all of the raw product methane in the gasifier SL

N82-11148# Babcock and Wilcox Co , Alliance, Ohio Research and Development Div

COMPUTATIONAL TOOLS FOR PULVERIZED-COAL COMBUSTION Quarterly Report, Mar. - Jun. 1981

W J Oberjohn, W Fiveland, D K Cornelius, J H Wang, and R J Schnipke Jul 1981 144 p refs (Contract DE-AC22-81PC-40265)

(DE81-028582, DOE/PC-40265/1, QR-1) Avail NTIS

A computer code capable of modeling the major aspects of pulverized coal combustion was developed. The combustion model (COMO) consists of a number relatively independent modules that represent the major processes involved in pulverized coal combustion. Version one of COMO is used primarily to determine a satisfactory means of integrating the numerical models of the combustion processes into an overall combustion model. Detailed task descriptions were prepared, literature searches conducted. and process models selected for version one. The formulation and coding of the models was initiated and, in some cases. comparisons with data and other predictions were made. Code development guidelines were prepared and reviewed. The guidelines present the information required to allow process modules to be developed relatively independently, while providing

for the subsequent integration of these modules into COMO

N82-11149# Battelle Pacific Northwest Labs , Richland, Wash TECHNIQUES FOR GEOTHERMAL LIQUID SAMPLING AND ANALYSIS

C H Kindle and E M Woodruff Jul 1981 102 p refs (Contract DE-AC06-76RL-01830)

(DE81-030151, PNL-3801) Avail NTIS HC A06/MF A01 A methodology was developed that is particularly suited to liquid-dominated resources and adaptable to a variety of situations It is intended to be a base methodology upon which variations can be made to meet specific needs or situations. The approach consists of recording flow conditions at the time of sampling, a specific insertable probe sampling system, a sample stabilization procedure, commercially available laboratory instruments, and data quality check procedures

N82-11151# Oak Ridge National Lab. Tenn Engineering Div

TENNESSEE VALLEY AUTHORITY ATMOSPERIC FLUID-IZED-BED COMBUSTOR SIMULATION Interim Annual Report, 1 Jan. - 31 Dec. 1980

J W Wells, M H Culver (Georgia Inst of Technology), and R P Krishman Sep 1981 263 p refs

(Contract W-7405-eng-26)

(DE81-030262 ORNL/TM-7847) HC A12/MF A01

The development of a steady-state mathematical model with the capability of predicting trends in bed performance under various feed and operating conditions is discussed. Three additional predictive subcodes were developed the SO2 capture subcode, the NO/sub x/ emissions subcode, and the freeboard subcode The following subcodes were combined to form an overall simulation code of the AFBC bed (1) bubble growth subcode. (2) elutriation-attrition subcode, (3) coal combustion subcode, (4) SO2 capture subcode and (5) NO/sub x/ emissions subcode An energy balance routine was added to the combined code The resulting overall bed simulation is capable of predicting how some of the important operating variables affect AFBC's performance. The freeboard model was combined with the overall bed simulation and is currently being debugged

N82-11152# Illinois Univ at Chicago Circle, Chicago VERTICAL COMBUSTOR FOR REFUSE COMBUSTION Paul M Chung Jun 1981 64 p refs Prepared for Argonne National Lab , III

(Contract W-31-109-eng-38)

NTIS (DE81-030002. ANL/CNSV-TM-80) HC A04/MF A01

A vertical combustor for refuse-particle combustion was analyzed for waste-to-energy recovery. A one dimensional model was constructed that consisted of fuel particles, inert solid particles, and the gaseous mixture. The gaseous mixture was divided further into six chemical species that are involved in combustion at temperatures below about 2000 F It was concluded that such combustors may be viable in the United States since US refuse contains large amounts of volatile matter Combuston of the relatively small char, however, may not be cost-effective in the present combustor where the fuel residence time is on the order of 2 s for a combustor height of 20 to 30 ft. A computer solution was designed to optimized a given combustor system A simplified version of the solution was programmed for a TI-59 programmable hand calculator for field

N82-11153# Stanford Univ , Calif Petroleum Research Inst ALGORITHM FOR COMPUTING IN-SITU COMBUSTION OIL RECOVERY PERFORMANCE

Mohammad R Fassihi, Brian D Gobran, and Henry J Ramey, Jr Oct 1981 29 p refs

(Contract DE-AC03-76ET-12056)

(DE81-030340, DOE/ET-12056/25 SU-SUPRI-TR-25) Avail NTIS HC A03/MF A01

An algorithm was developed to estimate the in-situ combustion performance in the field. A calculator program was prepared using this algorithm. The program is efficient, simple and accurate Given estimates of fuel concentration, air/fuel ratio, gas and oil saturations and injection rate, for each volume burned, oil recovery, air requirement, and time may be calculated DOF

N82-11154# Massachusetts Inst. of Tech., Oak Ridge, Tenn. School of Chemical Engineering Practice

ALUMINUM RECOVERY FROM FLY ASH AND SHALE-RETORT WASTES

J L Plawsky, R K Helling, and M E Tsui Jul 1981 72 p refs

(Contract W-7405-eng-26)

(DE81-027675. ORNL/MIT-331) Avail

HC A04/MF A01 The sparge-crystallization step in a proposed process for aluminum recovery from fly ash was studied. The effect of various feeds and HCl concentration on the solubility of six metal ions was investigated, and the yield and purity of the crystals obtained Significant improvements in data consistency were obtained over previous work on this system. Multistage crystallization and washing will be necessary to achieve removal of K and Mg to meet product specification. The replacement of ferric ion with ferrous ion produced an increase in Mg solubility, leading to the conclusion that more work is required with ferrous feeds and with multistage crystallizations. Experiments with leachate from oil-shale-retort residues produced 99 87% aluminum purity A predictive correlation proposed by Meissner was used to predict solubilities of pure and mixed salts in hydrochloric acid solutions Modification of the correlation's parameters yielded excellent agreement with theory for the AICI3-HCI system

N82-11158# Polytechnic Inst. of New York, Farmingdale Aerodynamics Labs

ONE-DIMENSIONAL EQUILIBRIUM-CHEMISTRY FLOW MODEL FOR COAL COMBUSTORS

P M Sforza, M Smorto, and W Peter May 1981

(Contracts DE-AC01-78ET-11056, ET-78-C-01-3084)

(DE81-027622, DOE/ET-11056/T5, POLY-M/AE-81-8) Avail NTIS HC A06/MF A01

A quasi one dimensional steady flow analysis for high temperature coal combustors was developed Results for the case of global heat release based on fuel heating value were compared to those obtained with a finite rate chemical reaction combustor analysis and reasonable agreement between the two was demonstrated. An existing chemical equilibrium computer code was then coupled to the one dimensional gas dynamic code to improve the accuracy of the required thermodynamic and chemical input data, the coupled code is called COMBUSTOR The second stage or a coal fired MHD combustor designed for large scale operation was modeled by means of the COMBUSTOR code for cases with and without heat transfer, and for varying amounts of potassium carbonate seed injection. Results for combustor exit temperature, composition, velocity, and electrical conductivity from the model are shown to agree well with those obtained in the operational combustor

NB2-11164# AeroChem Research Labs , Inc , Princeton, N J SOOT FORMATION IN SYNFUELS Quarterly Report, 1 Jan. - 31 Mar. 1981

D B Olson Aug 1981 21 p refs Prepared in cooperation with the Pittsburgh Energy Technology Center, Pa

(Contract DE-AC22-80PC-30304)

(DE81-030273, DOE/PC-30304/2, QR-2) Avail NTIS HC A02/MF A01

An experimental program is underway to study the effects of molecular structure, pressure, and temperature on soot production in laboratory flames of selected synfuel component hydrocarbons. The objective of Task I is to measure the Threshold Sooting Index, flame temperature, and soot concentration for some 50 fuels in premixed and diffusion flames. During this reporting period a new liquid metered fuel vaporizer was built and tested to replace a boiler-type fuel system that failed to perform adequately. The three wavelength optical probe for measuring emission temperatures and soot concentrations was built and calibrated against a tungsten lamp. Sampling probes for the mass spectrometer being used in Task II for flame structure analysis were tested this period. The 900 stainless steel sampling probes failed due to overheating to 1200 probes were built (with thicker walls and a higher temperature steel alloy). A new electrostatic lens system to focus the flame ions into the mass filter was also built and installed in the apparatus

N82-11165# Gulf Research and Development Co., Pittsburgh, INVESTIGATION OF MECHANISMS OF HYDROGEN

04 FUELS AND OTHER SOURCES OF ENERGY

TRANSFER IN COAL HYDROGENATION Annual Progress Report, Feb. 1980 - Feb. 1981

D C Cronauer, R I McNeil, D C Young, and R G Ruberto

Jul 1981 72 p refs (Contract DE-AC22-80PC-30080)

(DE81-030492. DOE/PC-30080/4) NTIS Avail

HC A04/MF A01

Hydrogen transfer experiments using Powhatan No 5 bituminous coal (Pittsburgh Seam) and labeled solvents are complete. The liquefaction runs with d4-tetrain were made at temperatures of 300 to 4500 C and at run times of 0, 10 and 30 min, additional runs were made with d12-tetralin at 400 and 4500 C Product samples were examined by (2)H-NMR to observe the site of deuterium transfer. The relative distribution of deuterium was primarily influenced by reaction temperature and not run time in spite of a major change in the absolute amount of hydrogen transfer with run time. Much of bituminous coal liquefaction occurs during the reactor heat-up time even though a low level of hydrogen transfer occurs. Therefore, the subsequent hydrogen (deuterium) distribution is strongly influenced by up-grading type reactions that occur Hydrogen/deuterium exchange occurs to a sizable level at the severe conditions of coal liquefaction, this strongly affects the distribution of deuterium in the products. This exchange is enhanced by the pressure of heavy aromatic species and by mineral matter and unconverted

N82-11166# Virginia Polytechnic Inst. and State Univ. Blacksburg

DEVELOPMENT AND APPLICATION OF ANALYTICAL TECHNIQUES TO CHEMISTRY OF DONOR SOLVENT LIQUEFACTION Quarterly Progress Report, Apr - Jun. 1981

H C Dorn and L T Taylor Aug 1981 19 p refs (Contract DE-AC22-80PC-30041)

DOE/PC-30041/T6) (DE81-029125. NTIS

HC A02/MF A01

On-line IC-(h-1) nmr analysis of coal recycle solvents is presented. This technique is also complimented with a gas chromography-mass spectroscopic analysis of off-line LC fractions

N82-11167# Virginia Polytechnic Inst. and State Univ.
Blacksburg Dept of Chemistry
DEVELOPMENT AND APPLICATION OF ANALYTICAL

TECHNIQUES TO CHEMISTRY OF DONOR SOLVENT LIQUEFACTION Quarterly Progress Report, Jan. - Mar. 1981

H C Dorn and L T Taylor Jul 1981 20 p refs (Contract DE-AC22-80PC-30041) (DE81-025961. DOE/PC-30041/T5)

NTIS HC A02/MF A01

The operation of modern superconducting magnet based spectrometers in the liquid chromatography-proton nuclear magnetic resonance spectroscopy (LC-(1)H) NMR mode is fairly simple in light of the considerable improvements made in this technique, LC-(1)H NMR has shown itself to be quite useful in fuel analysis. The limits of detection are now sufficiently low to be near that of the refractive index detector improvements in resolution (both chromatographic and spectroscopic) have made speciation within a class possible. The LC-(1)H NMR technique increases the convenience and reliability of determining the average degree of substitution. Results are reported of runs made

n-butylbenene m-xylene, tetralin, naphthalene, dodecane, isooctane, n-hexane, nonane, hexadecane and n-pentane N82-11168# Air Products and Chemicals, Inc., Allentown, PaCATALYST AND REACTOR DEVELOPMENT FOR A

on a jet fuel and a model mixture which was prepared by mixing

LIQUID-PHASE FISCHER-TROPSCH PROCESS Quarterly Technical Progress Report, 1 Jan. - 31 Mar. 1981 J. W. Brockington, Paul N. Dyer, Ronald Pierantozzi, Barry W.

Brian, and Jeffrey V Bauer Apr 1981 47 p refs (Contract DE-AC22-80PC-30021)

(DE81-028209. DOE/PC-30021/T4) NTIS Avail

HC A03/MF A01

The computerized literature search of Fischer-Tropsch literature was continued, refinements in analytical procedures were implemented, the first 300 mL slurry reactor was completed, and catalyst screening tests were begun in the 15 mL gas-phase tubular reactor. Two of ten modified conventional slurry catalysts

were prepared. Two batches of one of these catalysts, representing different pretreatment procedures, and a baseline Fischer-Tropsch catalyst were tested in the gas phase reactor. Eight metal cluster catalysts were screened in a gas phase reactor. Construction of the cold flow reactor simulator was completed and initial experiments begun. The persistant foaming problem associated with the use of kerosene as a cold flow liquid was overcome by using a C (9)-C11 isoparaffin mixture instead of kerosene

N82-11169# Argonne National Lab , III Fossil Energy Program

MATERIALS TECHNOLOGY FOR COAL-CONVERSION PROCESSES Progress Report, Jan. - Mar. 1981

W A Ellingson Jun 1981 47 p refs

(Contract W-31-109-eng-38)

(DE81-028474, ANL-81-30) Avail NTIS HC A03/MF A01 Microprobe studies of reaction layers on refractories exposed to a high (20 wt percent) iron oxide acidic coal slag suggest that the amount of iron oxide in the reaction layer immediately adjacent to the slag increases significantly as the chromia content in the refractory increases. Waveguides were installed at the SRC pilot plant to monitor erosive wear Installation of the ANL-designed erosion scanner at the Exxon Coal Liquefaction Pilot Plant was completed Nondestructive tests of the HYGAS high-pressure cyclone separator showed that the cyclone internal cone has eroded through in some areas. Evaluation of wear of the METC tar-separator cyclones and solids-separator cyclone continued the addition of B4C hardfacing has reduced the wear rate in one of the tar cyclones. Preliminary tests were conducted on the capability of an electromagnetic acoustic transducers to measure wall thickness. Work on passive acoustic methods to detect leaks in block valves continued. Work continued to evaluate the effect of combustion gas stoichiometry and deposits on the corrosion behavior of air and steam heat-exchanger tubes. Results indicate that high-chromium alloys such as Type 310 stainless steel exhibit a protective Cr oxide layer in the absence of a

N82-11224* # Lockheed-California Co., Burbank EXPERIMENTAL STUDY OF FUEL HEATING AT LOW TEMPERATURES IN A WING TANK MODEL, VOLUME 1 Final Report

Francis J Stockemer Aug 1981 75 p refs (Contract NAS3-21977) (NASA-CR-165391, LR-29935-Vol-1)

NTIS Avail

HC A04/MF A01 CSCL-21D

Scale model fuel heating systems for use with aviation hydrocarbon fuel at low temperatures were investigated. The effectiveness of the heating systems in providing flowability and pumpability at extreme low temperature when some freezing of the fuel would otherwise occur is evaluated. The test tank simulated a section of an outer wing tank, and was chilled on the upper and lower surfaces. Turbine engine lubricating oil was heated, and recirculating fuel transferred the heat. Fuels included a commercial Jet A, an intermediate freeze point distillate, a higher freeze point distillate blended according to Experimental Referee Broadened Specification guidelines, and a higher freeze point paraffinic distillate used in a preceding investigation. Each fuel was chilled to selected temperature to evaluate unpumpable solid formation (holdup). Tests simulating extreme cold weather flight, without heating, provided baseline fuel holdup data. Heating and recirculating fuel increased bulk temperature significantly, it had a relativley small effect on temperature near the bottom of the tank Methods which increased penetration of heated fuel into the lower boundary layer improved the capability for reducing holdun

N82-11228# Air Force Wright Aeronautical Labs. Wright-Patterson AFB. Ohio Fuels and Lubrication Div JET FUEL LOCKS TO SHALE OIL: THE 1980 TECHNOLOGY

Herbert R Lander May 1981 156 p refs Proceedings of

Conf held at Cincinnatti, 19-20 Nov 1980 (AF Proj 2480)

AFWAL-TR-81-2063) NTIS Avail

HC A08/MF A01 CSCL 11/4

(AD-A104414.

The progress of several Air Force shale oil related programs is reported. Three shale oil processing studies evaluating the yield, cost, and quality of JP-4 and JP-8 turbine fuel produced from whole crude shale oil are discussed. Details of a fourth program that produced 11,300 gallons of specification JP-4 from Geokinetics shale oil are reported. Some of this jet fuel was tested in Air Force Fuel Mainburner/Turbine Effects Programs and was shown to behave very similar to petroleum derived JP-4 An additional study concentrated on developing hydrotreating catalysts that would more efficiently convert shale oil into aviation turbine fuel Author (GRA)

N82-11231# Naval Ship Research and Development Center, Annapolis, Md Ship Materials Engineering Dept OUTGASSING OF TWO SYNTHETIC FUELS Final Report Peter Demas Sep 1981 25 p refs (ZF43451001)

(AD-A104580, DTNSRDC/SME-80/46)

HC A02/MF A01 CSCL 21/4

The outgassing characteristics of two synthetic fuels proposed for Navy use were investigated to determine whether potentially toxic gases could be released into ships' atmospheres. The synthetic fuels studied were (1) shale diesel fuel W-375 prepared to conform to MIL-F-16884G and (2) shale jet fuel W-383 prepared to conform to MIL-T-5624K. These outgassing characteristics of the synthetic fuels were compared to the outgassing characteristics of a conventional petroleum fuel conforming to MIL-16884G obtained from USS PONCE (LPD 15) Single samples of each fuel were sequentially exposed to temperatures of 50, 150, and 250 C for 3 hours at each temperature, and the types and amounts of the outgassed products were determined Carbon monoxide hydrocarbons, aldehydes, nitrogen oxides, and sulfur dioxide were outgassed. Of these, only the amount of carbon monoxide produced by diesel fuel W-375 and the amount of aldehydes produced by the conventional diesel fuel were relatively significant since each exceeded the Threshold Limit Value for these constituents by a factor of about 13 Some decomposition was evidenced when fuel W-375 was heated up to 245 C. It is recommended that similar studies be performed with more types of synthetic fuels as these develop and become available in order to establish a better comparison of outgassing between these fuels and the conventional fuels

N82-11235# Agri Stills of America, Springfield, III DEVELOPMENT OF A SMALL-SCALE COMMERCIAL ALCOHOL DEHYDRATION 190 TO 200 PROOF

Report 1981 5 p refs

(Contract DE-FG02-81AF-92005)

(DE81-030158, DOE/AF-92005/T1)

NTIS Avail

NTIS

Avail

HC A02/MF A01

A small scale farm sized commercial unit to produce anhydrous 200 proof ethanol from 190 proof source of locally produced grain alcohol (ETOH) was investigated. The approach is to investigate a low pressure process to efficiently separate water from 190 proof alcohol, with and without the use of a third component to break the azeotrope of water and alcohol formed during atmospheric conditions. Results from this experiment show that a vacuum shell is not sufficient in design to effect wet alcohol to the anhydrous state DOF

N82-11236# Cincinnati Univ. Ohio Dept of Chemistry COAL HYDROGENATION VIA BONDING OF METALLIC COMPOUNDS TO COAL, PART 1. SOLUBILIZATION OF ILLINOIS BITUMINOUS COAL - THE CRITICAL IMPOR-TANCE OF METHYLENE GROUP CLEAVAGE, PART 2 Final Report

Milton Orchin 1981 23 p refs (Contracts DE-ASO1-76ET-10517, EF-76-01-2308-10) NTIS (DE81-027562. DOE/ET-10517/T1) HC A02/MF A01

Data for the hydrogenation of Elkhorn coal at 390 C with initial pressure of 138 MPa hydrogen and with various catalysts (stannous chloride and complexes of cobalt and tin), and solvents (decalin and tetralin) are presented in tabular form and results are discussed. Model compounds of coal, polystyrene beads were tin-bonded and tin-impregnated, then hydrogenated under various temperatures, pressures, and with either decalin or tetralin Results show both hydrogen and the tin catalyst are necessary for liquefaction at 390 C, and under comparable conditions, bonded tin gave greater liquefaction than impregnated tin but with considerably greater hydrogen consumption. In the coal solubilization study, solubilization by hydroliquefaction and by chemical reduction with potassium in tetrahydrofuran seems to indicate that initial degradation of coal by both techniques proceeds by ether cleavage and that further degradation is achieved in both cases by methylene bridge attack. The nuclear magnetic resonance studies on hydroliquefaction products indicate that Illinois bituminous coal is structurally quiet homogeneous.

NTIS

N82-11237# Northern Resources, Inc., Billings, Mont FEASIBILITY AND ECONOMIC STUDY OF MEDIUM-BTU COAL GAS BLENDED WITH HIGH-BTU BY PRODUCT GAS AS AN INDUSTRIAL ENERGY SOURCE AT BILLINGS, MONTANA

May 1981 23 p (Contract DE-FG01-79RA-20219) (DE81-025166, DOE/FE-20219/1) Avail HC A02/MF A01

The technical and economic feasibility of blending a medium Btu gas (CMG) produced from coal by the Winkler fluidized bed gasification process with excess refinery fuel gas to be used as an industrial fuel in Billings, Montana is assessed. The background of the project, the site selection process, the conceptual design of the process and supporting facilities, the retrofit requirements and other costs associated with burning the MBG, the environmental and permitting aspects of the project, the cost estimates and economic considerations, the contract provisions for MBG buy/sell agreements, the government's role in supporting the project and the market potential for the project in Billings and similar projects in other markets are discussed It is concluded that the project is technically feasible and economically viable today although parity with conventional fuels will not occur until

N82-11238# AmeriGas, Inc., Valley Forge, Pa CONCEPTUAL DESIGN FOR A MULTI-USER MEDIUM BTU **COAL GASIFICATION COMPLEX. VOLUME 1: EXECUTIVE** SUMMARY

Sep 1980 106 p (Contract DE-FG01-80RA-50135) (DE81-027139. DOE/FE-50135/2) NTIS Avail HC A06/MF A01

On the basis of fuel requirements, a gasifier to produce immediate Btu gas (250 Btu/SCF) at a scale of 8.3 million. Btu/day was designed The basic conclusion, based upon the \$6.45/MM Btu required selling price of IFG for this project, was that the facility, as designed, does not present a viable business opportunity. Still existing are the customer's need for long term, stable supplies of clean energy with high fuel utilization load factors. The failure to produce a viable business opportunity does not condemn the process or the project. Even at \$6.45/MM Btu, the economic attractiveness of the project was not so poor as originally perceived. When the recent volatile energy price variations are coupled with current rates of inflation and proposed deregulation of natural gas, the long-term attractiveness of IFG is visible. The hurdle here is convincing management that the risks of accepting a higher, yet secure cost of energy now is more than off-set by future savings Various financial incentives are considered

N82-11240# New York State Energy Research and Development Authority, New York

LOW/MEDIUM-BTU COAL-GASIFICATION ASSESSMENT PROGRAM FOR SPECIFIC SITES OF TWO NEW YORK UTILITIES

Dec 1980 377 p (Contract DE-FG01-79RA-20223) (DE81-025518. DOE/RA-20223/T1) NTIS HC A17/MF A01

The technical and economic aspects of coal gasification to supply low or medium Btu gas to two power plant boilers are investigated Coals from different regions of the country were investigated in terms of their availability, mode of transportation and delivered cost to each power plant site. The effects of burning low and medium Btu gas in the selected power plant boilers on efficiency, rating and cost of modifications are also examined Both plants meet the federal, state and local environmental requirements for air quality, wastewater liquid disposal, and ground level disposal of byproduct solids of the synthetic gas alternative result in bus bar cost savings on a yearly basis within a few years of start up because the cost of gas is assumed to escalate at a lower rate than that of fuel oil, approximately 4 to 5%

N82-11242# Gulf Science and Technology Co., Pittsburgh, Pa Chemical and Minerals Div.

04 FUELS AND OTHER SOURCES OF ENERGY

EFFECTS OF COMPONENTS OF SYNFUELS ON SOOT FORMATION Quarterly Technical Progress Report, 1 Apr. -30 Jun. 1981

J E Haebig and P M Goldberg Aug 1981 16 p refs (Contract DE-AC22-80PC-30307) (DE81-027961, DOE/PC-30307/3, Gulf-627RM073, QTPR-3) Avail NTIS HC A02/MF A01

The development of an experimental system for the study of the relationships between the rate and amount of soot formation in the combustion of coal derived synfuels and the chemical composition and molecular constituents of those fuels was completed A burner and pressure vessel were fabricated and assembled along with a flow control panel for seven gas streams The optical components for laser light scattering were used Future experimental features were identified. Data on coal liquid properties and composition are discussed

N82-11243# Minnesota Gas Co., Minneapolis
PEAT BIOGASIFICATION DEVELOPMENT PROGRAM Cambridge, Mass Dynatech R/D Co 21 Apr 1981 240 p

(Contract DE-AC01-79ET-14696, Dynatech Proj MGC-2) (DE81-028299, DOE/ET-14696/T6, Dynatech-2115) Avail NTIS HC A11/MF A01

The advantage of the biogasification method is it can use the peat in a high moisture state, thereby eliminating the need to provide energy for drying peat. A preliminary investigation (Appendix B) of the peat biogasification process (funded by Minnesota Gas Company) Showed potential technical and economic feasibility of the process, sufficient to carry out the present program Based on the results of the present program the solubilization, oxidation, and digestion steps have been defined sufficiently to lead to a more reliable process design and preliminary estimate of the fuel gas production costs. This present program was initiated to develop an experimental data base for the solubilization, oxidation, and fermentation reactions, and to use this data base to develop a conceptual preliminary process design and thus enable a preliminary estimation of the economics (capital and operating costs and unit gas costs) for process DOE

N82-11244# Argonne National Lab , III Energy and Environmental Systems Div

ADVANCED SYSTEM EXPERIMENTAL FACILITY: SOLID WASTE TO METHANE GAS. BACKGROUND AND PROCESS DESCRIPTION

R Isaacson and J Pfeiffer Mar 1981 15 p refs (Contract W-31-109-eng-38) ANL/CNSV-22) NTIS Avail -(DE81-030198. HC A02/MF A01

The Refuse Conversion to Methane Facility in Pompano Beach, Florida, a 100-ton/day experimental plant to convert municipal solid waste (MSW) to methane for fuel was designed to assess the technical ment of anaerobic digestion of the MSW process Approximately 40 ton/day of volatile solids are fed to the digesters, of this, about 25 ton/day will be converted to gases For each pound of volatile solids destroyed, 66 std cu ft of methane gas and 6 6 std cu ft of CO2 will be produced Thus. the plant will yield approximately 330,000 std cu ft/day each of methane and CO2. The most important process variables are to be tested allowing judgments to be made on scale up considerations

N82-11246# Battelle Pacific Northwest Labs , Richland, Wash PRODUCTION AND UTILIZATION OF METHANE FROM ANAEROBIC SLUDGE DIGESTION IN U.S. WASTEWATER-TREATMENT PLANTS

Jul 1981 109 p refs (Contract DE-AC01-76CS-20300) (DE81-029958. DOE/CS-20300/3) HC A06/MF A01

NTIS Avail

Three generic onsite uses were selected for energy and cost accounting analysis heat generation, mechanical energy generation, and electrical energy generation. Of the gas utilization methods analyzed, the most energy efficient and cost effective was found to be the direct production of mechanical energy to drive aerators and pumps. Between 50 and 80 percent of the mechanical energy required for wastewater treatment can be provided by digester gas. In addition, waste heat can be recovered from the engines to aid in heating the digesters and buildings Total energy costs for the mechanical energy generation scheme averaged around \$30/million gallons treated, compared to

\$34/million gallons and \$45/million gallons for the electrical energy generation and heat generation schemes, respectively

DOF

N82-11248# California Univ., Livermore Lawrence Livermore Lab

CONTROLLED RETRACTING INJECTION POINT (CRIP) SYSTEM: A MODIFIED-STREAM METHOD FOR IN SITU COAL GASIFICATION

R W Hill and M J Shannon 15 Apr 1981 10 p refs Presented at the 7th Underground Coal Conversion Symp , Fallen Leaf Lake, Calif., 8-11 Sep. 1981

(Contract W-7405-eng-48)

(DE81-026477, UCRL-85852, CONF-810923-2) Avail NTIS HC A02/MF A01

The principle of moving the injection point (where the combustion-supporting air or oxygen from the surface is fed into the coal seam) to new areas of unburned coal as the burn progresses in coal gasification is investigated. The controlled retracting injection joint or CRIP system is designed to keep the injection point on the bottom of the coal seam and to move it backwards away from the collapse zone into fresh, solid coal The principle of controlled retraction allows the operator to choose the optimum time and distance to move the injection point, and consequently the burn zone, to get the best possible performance from the gasifier Although this system will work with coal seams of any thickness, it is particularly well suited to thick coal seams where the cavity grows by coal collapse as well as combustion. Placement of the production channel at the top of the seam, above the injection well ensures isolation from the effects of collapse and reduces the risk of plugging the production well DOE

N82-11251# Department of Energy, Morgantown, W Va Energy **Technology Center**

ATMOSPHERIC FLUIDIZED-BED PROJECTS TECHNOLOGY OVERVIEW

Feb 1981 66 p refs (DE81-027143. DC DOE/METC-SP-108) NTIS HC A04/MF A01

The methodology by which DOE-funded projects achieved program goals and objectives is examined. The status of the technology is reviewed, and areas where further development or research is required and projects where this is being addressed are identified. Current program issues include feed systems, heat transfer, recycle, air-distributor grid design, ignition characteristics, output control, particulate emissions, reliability, and fuel flexibil-

N82-11253# Department of Energy, Morgantown, W Va Energy Research Center

SURFACE COAL GASIFICATION

Oct 1980 48 p refs

DOE/METC-SP-110) (DE81-030183,

HC A03/MF A01

The successful commercial application of surface gasification of coal could enable the United States to use from its vast deposits of coal to produce a wide variety of energy products and chemical feedstocks. The technology base is well developed and extremely flexible for converting coal into alternate products suitable for the demands of a broad and heterogeneous market and a wide array of users/owners. To meet the defined program objectives, several pilot plant and process-development operations are being conducted Four of these operations are described (1) combustion engineering low-Btu entrained-bed gasifier. (2) bi-gas high-Btu entrained-bed gasifier; (3) ash-agglomerating fluid-bed gasifier, and (4) the short-residence time high-8tu hydrogasifier Gasification technology-crosscut conclusions and results of technical problems and issues common to the four pilot plants are discussed

N82-11254# Department of Energy, Morgantown, W Va. ADVANCED-GASIFICATION PROCESSES

Dec 1980 66 p refs

(DE81-030184. DOE/METC-SP-183) Avail.

HC A04/MF A01

An analysis of the needs for commercial gasification reveals the following principal categories of information gaps that can be filled by programs already in progress or those readily initiated The gaps are technology base need required for successful commercialization of both currently available and advancedgasification processes. The needs are defined further in Table

2-1, which shows the current status of the technology data base The need areas are classified as follows Coal Preparation/ Feeding/Fins Management, Reactor Design/Performance, Gas Cleaning/Cooling, Acid Gas Removal/Gas Shift and Conversion Data Base on State-of-the-Art and Advaced Technologies, Health/ Components/Materials/Instrument Development. Environmental/Safety, and General It is anticipated that solutions to many of the problems associated with the demonstration plants, the alternative fuel plants, and the Synthetic Fuel Corporation endeavors will not be available during the design and construction phases. However, during the operating and optimization phases of most of these projects prior to commercialization, where additional will have provided the additional data base needed to correct deficiencies and/or to advance the state of the art DOE

N82-11258# Battelle Pacific Northwest Labs , Richland, Wash **Biomass Program Office**

TRANSPORTATION FUELS FROM SYNTHETIC GAS

E G. Baker and R Cuello Aug 1981 25 p refs (Contract DE-AC06-76RL-01830)

(DE81-029614, PNL-3951) Avail NTIS HC A02/MF A01

Twenty-five experimental Fischer-Tropsch synthesis runs were made with 14 different catalysts or combinations of catalysts using a Berty reactor system. Two catalysts showed increased selectivity to transportation fuels compared to typical Fischer-Tropsch catalysts. With a catalyst consisting of 5 wt percent rutnenium impregnated on a Y zeolite (run number 24), 63 to 70 wt percent of the hydrocarbon product was in the gasoline boiling range. Using a 0.5 wt percent ruthenium on alumina catalyst (run number 22), 64 to 78 wt percent of the hydrocarbon product was in the diesel fuel boiling range. Not enough sample was produced to determine the octane number of the gasoline from run number 24, but it is probably somewhat better than typical Fischer-Tropsch gasoline (approx 50) and less than unleaded gasoline (approx 88) The diesel fuel produced in run number 22 consisted of mostly straight chained paraffins and should be an excellent transportation fuel without further refining The yield of transportation fuels from biomass via gasification and the Fischer-Tropsch synthesis with the ruthenium catalysts is somewhat less, on a Btu basis, than methanol (via gasification) and wood oil (PERC and LBL processes) yields from biomass

DOF

N82-11259# Utah Univ. Salt Lake City Dept of Mining and Fuels Engineering

CHEMISTRY AND CATALYSIS OF COAL LIQUEFACTION: CATALYTIC AND THERMAL UPGRADING OF COALLIQUID AND HYDROGENATION OF CO TO PRODUCE FUELS Quarterly Progress Report, Oct. - Dec. 1979

W H Wiser Aug 1980 73 p refs (Contract DE-AC01-79ET-14700)

(DOE/ET-14700/1) Avail NTIS HC A04/MF A01

Studies of the chemistry and catalysis of coal hydrogenation have been initiated with the construction of a flow reactor for extraction of coal and the development of analytical techniques Work was initiated on the design of a rotor for (13)C nuclear magnetic resonance of solid coal and extracted coal. Studies on momentum, heat and mass transfer in a fluidized bed simulated conditions for coal hydrogenation and were used to investigate effects of particle size and solids loading. The catalytic upgrading of coal-derived liquids is investigated by studies of the catalytic denitrogenation, desulfurization, deoxygenation and cracking of model compounds Aging of Co-Mo catalysts was found to reduce the number of active sites but not the nature of the sites. A Raney catalyst is being developed for the hydrogenation of carbon monoxide Temperature programmed desorption was used to study the properties of an iron manganese oxide catalyst previously shown to give high yields of C2-C10 hydrocarbons DOE

N82-11260# Utah Univ, Salt Lake City Dept of Mining and Fuels Engineering

CHEMISTRY AND CATALYSIS OF COAL LIQUEFACTION: CATALYTIC AND THERMAL UPGRADING OF COAL LIQUID AND HYDROGENATION OF CO TO PRODUCE FUELS Quarterly Progress Report, Jan. - Mar. 1980

Wendell H Wiser Aug 1980 70 p refs

(Contract DE-AC22-70ET-14700)

(DOE/ET-14700/2) Avail NTIS HC A04/MF A01

Analysis of a group of coal liquids produced by catalytic hydrogenation of Utah coals with ZnCl2 catalyst was begun Carbon-13 nuclear magnetic resonance and liquid chromatography

techniques will be used to correlate chemical properties with hydrogenation reactivity. Equipment previously used for downflow measurements of heat and momentum transfer in a gas-coal suspension was modified for upflow measurements. The catalytic hydrodeoxygenation of methyl benzoate has been studied to elucidate the reactions of ester during upgrading of coal-derived liquids. The kinetics of hydrogenation of phenanthrene have also been determined. The catalytic cracking mechanism of octahydroanthracene is reported in detail. Studies of the hydrodesulfurization of thiophene indicate that some thiophene is strongly adsorbed as a hydrogen-deficient polymer on cobalt-molybdate catalyst Part of the polymer can be desorbed as thiophene by hydrogenation. Poisoning of the catalyst inhibits the hydrosulfurization activity to a greater degree than the hydrogenation activity Iron-manganese catalysts for carbon monoxide hydrogenation is studied to determine the role of iron carbide formation on selectivity. Pure iron catalyst forms a Hagg iron carbide phase unde reaction conditions

NB2-11261# COECORP, Mountain View, Calif
WORKSHOP PROCEEDINGS: COMBUSTION TURBINE RESIDUAL OIL

May 1981 291 p Workshop held at Atlanta, 17-18 Jul 1980 Sponsored by EPRI

(EPRI-WS-80-132,

CONF-8007109) HC A13/MF A01

NTIS

Technology developed for the reliable and efficient operation of gas turbines using heavy fuel oils or alternative to petroleum distillates is described. Topics covered include combustion system. design, turbine gas path design, corrosion resistant materials, turbine deposits, fuel treatment, fuel processing, and additives Turbine operating conditions and performance are also discussed

N82-11267# California Univ , Livermore Lawrence Livermore

LLNL UNDERGROUND COAL GASIFICATION PROJECT Quarterly Progress Report, Jan. - Mar. 1981

D U Olness, ed and Wallace Clements, ed 27 Apr 1981 42 p refs

(Contract W-7405-eng-48)

(DE81-030634. UCRL-50026-81-1) Avail NTIS

HC A02/MF A01

Laboratory studies of forward gasification through drilled holes in small blocks of coal, approximately 1 foot on a side were conducted Such studies give insight into cavity growth mechanisms and particulate production. However, because of the small dimensions involved, the information these tests provide is necessarily limited to aspects of cavity growth at very early times. The preliminary process design of the Tono No. 1 field experiment in Washington was completed. The experimental plan and operational strategy was developed to ensure that the injection point remains near the bottom of the coal seam and that the experiment continues at least until a period of stable operation is reached and sustained for a time. A mathematical model for the small coal block experiments in order to further our understanding of the physical and chemical processes governing the burning of the coal and the growth of the cavity within the block is being developed. Groundwater samples from wells located at distances of a few feet to several hundred feet from the gasification cavities were collected before, during, and after each of the Hoe Creek tests. The analysis of the groundwater contamination data pertinent to the Hoe Creek No 3 test was

N82-11269# Water Resources Council, Washington, D C COAL LIQUEFACTION DEMONSTRATION PLANT NEAR MORGANTOWN, WEST VIRGINIA; WATER ASSESSMENT REPORT SECTION 13(b) Final Report

Nov 1980 40 p refs Prepared in cooperation Ohio River Basin Commission

(PB81-216095) Avail NTIS HC A03/MF A01 CSCL 08H Water requirements and water supply availability were assessed for a proposed coal liquefaction demonstration project at Fort Martin near Morganown, WV A policy for consumptive use makeup and the impact on other offstream uses, navigation, and water quality are also examined GRA

N82-11271# TRW, Inc., McLean, Va **Energy Engineering**

GAS RECOVERY FROM COAL DEPOSITS Final Report

04 FUELS AND OTHER SOURCES OF ENERGY

A A Lee, C R Skillern, and D R Watkins Jan 1981 113 p refs

(Contract GRI-5011-321-0101)

PB81-222291. GRI-80/0033) NTIS Avail HC A06/MF A01 CSCL 081

The production potential of coalbeds at depth below 2500 feet was assessed and the effectiveness of hydraulic

fracturing in deep coalbeds was determined. Two deep tests were performed, one in the Greater Green River Area and one in the Piceance Basin, both in Colorado

N82-11397*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

LEWIS RESEARCH CENTER'S COAL-FIRED, PRESSURIZED, FLUIDIZED-BED REACTOR TEST FACILITY

John A Kobak and R James Rollbuhler Oct 1981 35 p rafe

(NASA-TM-81616, E-621) Avail NTIS HC A03/MF A01 CSCL 20D

A 200-kilowatt-thermal, pressurized, fluidized-bed (PFB) reactor, research test facility was designed, constructed, and operated as part of a NASA-funded project to assess and evaluate the effect of PFB hot-gas effluent on aircraft turbine engine materials that might have applications in stationary-power-plant turbogenerators. Some of the techniques and components developed for this PFB system are described. One of the more important items was the development of a two-in-one, gas-solids separator that removed 95+ percent of the solids in 1600 F to 1900 F gases Another was a coal and sorbent feed and mixing system for injecting the fuel into the pressurized combustor Also important were the controls and data-acquisition systems that enabled one person to operate the entire facility. The solid, liquid, and gas sub-systems all had problems that were solved over the 2-year operating time of the facility, which culminated in a 400-hour, hot-gas, turbine test

N82-11404# Denver Research Inst., Colo TWO-PHASE FLOW IN GEOTHERMAL ENERGY SOURCES Final Technical Report

Jul 1981 240 p refs Prepared jointly with Coury and Associates. Lakewood, Colo and Houston Univ

(Contract De-ACO2-76ET-28359)

(DE81-029037, DOE/ET-28359/T1)

Hc A11/MF A01

A geothermal well consisting of single and two-phase flow sections was modeled in order to explore the variables important to the process. For this purpose a computer program was developed in a versatile form in order to be able to incorporate a variety of two phase flow void fraction and friction correlations A parameteric study indicated that the most significant variables controlling the production rate are hydrostatic pressure drop or void fraction in the two-phase mixture and heat transfer from the wellbore to the surrounding earth. Downhole instrumentation was developed and applied in two flowing wells to provide experimental data for the computer program. The wells (East Mesa 8-1, and a private well) behaved differently Well 8-1 did not flash and numerous shakedown problems in the probe were encountered. The private well did flash and the instrumentation detected the onset of flashing A Users Manual was developed and presented in a workshop held in conjunction with the Geothermal Resources Council

N82-11405# Oak Ridge National Lab , Tenn CYCLE AND PERFORMANCE ANALYSIS OF ABSORPTION HEAT PUMPS FOR WASTE HEAT UTILIZATION

Horacio Perez-Blanco and Gershon Grossman Sep 1981 56 p refs

(Contract W-7405-eng-26)

(DE81-030705. **ÖRNL/TM-7852**) Avail NTIS

HC A04/MF A01

A heat pump was designed to upgrade low-temperature waste heat by boosting its temperature typically from 600 C (1400 F) to 1200 C (2500 F) The system uses part of the low-temperature heat as its energy source and does not need outside power. except for running small auxiliary equipment. The heat pump employs a desorber/evaporator combination in which some hot water from the heat source is evaporated and the vapor is absorbed in a concentrated absorbent solution. The heat of absorption serves to raise the temperature of the rest of the hot water stream Two stages of the system are used in series to provide the desired temperature boost. Both are served by one desorber which uses part of the waste heat to concentrate the solution

Both open- and closed-cycle regeneration of the solution was studied. The operation of the system is described and its performance criteria defined. Results of a computer study show the variation in performance with different design variables. Two working materials. LiBr-water and LiCI-water, are considered

DOF

N82-11474# California Univ , Berkeley Lawrence Berkeley Lab

NOVEL DESIGN OF PRESSURE VESSELS AND THERMAL SHIELDS IN COAL GASIFIERS

B W Loo Jun 1981 11 p refs Presented at the Symp on Instr and Control for Fossil Energy Processes, San Francisco, 7-10 Jun 1981

(Contract W-7405-eng-48)

(DE81-025828, LBL-12807) Avail NTIS HC A02/MF A01 Two outstanding problems in commercial sized coal gasifiers, namely, detecting and locating any deterioration in the refractory thermal barrier and the construction of a safe pressure vessel utilizing advanced carbon fiber composite technology are described Design considerations are given for a typical gasifier some 30 feet in diameter by 150 feet tall with a maximum internal temperature and pressure of 2500 F and 1500 psi respectively. A system of computer controlled cooling circuits is deployed between the refractory barrier and the external lightweight pressure vessel. Multiple levels of redundancy are built in to guard against any component failure. Through the sensing of coolant temperature and the modulation of coolant flow, a map of heat flux distribution over the gasifier wall may be generated with a spatial resolution of about 5 feet Results indicate that the coolant temperature rise can be maintained by no more than 90 F with only a modest amount of coolant flow

N82-11516*# Jet Propulsion Law, California Inst of Tech. Pasadena

GEOLOGIC CONSIDERATIONS IN UNDERGROUND COAL MINING SYSTEM DESIGN

Frank A Camilli, David P Maynard, Arnis Mangolds, and Jack Harris 1 Oct 1981 52 p refs (Contracts NAS7-100, DE-AIO1-76ET-12548)

(NASA-CR-164961, JPL-Pub-81-74, DOE/ET-12548/9) Avail NTIS HC A04/MF A01 CSCL 081

Geologic characteristics of coal resources which may impact new extraction technologies are identified and described to aid system designers and planners in their task of designing advanced coal extraction systems for the central Appalachian region. These geologic conditions are then organized into a matrix identified as the baseline mine concept A sample region, eastern Kentucy is analyzed using both the developed baseline mine concept and the traditional geologic investigative approach

N82-11518# Argonne National Lab , III Energy and Environmental Systems Div

PETROLEUM GEOLOGY AND RESOURCE ASSESSMENT OF THE MIDDLE CASPIAN BASIN, USSR, WITH SPECIAL EMPHASIS ON THE UZEN FIELD

G Ulmishek and W Harrison May 1981 157 p refs (Contract W-31-109-eng-38)

(DE81-029951, ANL/ES-116) Avail NTIS HC A08/MF A01

The Middle Caspian Basin contains up to 12 000 m (40,000 ft) of sedimentary rocks ranging in age from late Paleozoic to Quaternary and has over 100 oil and gas fields varying in size from small to supergiant. The Soviet literature reviewed covers (1) tectonic zones of the basin, including details of the lower, intermediate, and upper structural complexes. (2) paleogeography, facies distribution, and conditions of organic matter accumulation in the major petroleum source rocks. (3) stages of oil and gas generation, (4) major hydrogeological features, and (5) producing regions of the basin. Total initial petroleum resources of the basin are estimated at 22.5 x 10(9) t (166 x 10(9) bbl), of which 16 00 x 10(9) t (118 x 10 (9) bbl) are yet to be discovered Resources of the Offshore Caspian Sea area are estimated to be 12 1, 10(9) t (89 5 x 10(8) bbl)

N82-11519# Rhode Island Univ. Kingston PLANNING A COMPREHENSIVE PROGRAM FOR EXPLO-RATION OF THE ANTHRACITE DEPOSITS OF THE NARRAGANSETT BASIN OF MASSACHUSETTS AND RHODE ISLAND, PHASE 1 AND 2 Final Report J W Skehan Feb 1981 131 p refs

(Contract DE-ACO1-79RA-2036) (DE81-028490. DOE/FE-20036/1) NTIS HC A07/MF A01

Coal deposits occur in a sporadic fashion throughout the Basin with little continuity as to the type of deposit and the quality of coal thus making it difficult, perhaps very expensive and risky, to base a drilling program soley on stepping out from known outcrops and coal occurrences. The combination of understanding the original depositional environment, its subsequent deformation to stepping out from known coal occurrences. is believed to be the most efficient basis for developing a comprehensive drilling program plan for the Basin This limited exploration program produced resource estimates of 11 35 million tons of anthracite material in the eastern and 473 in the western part of Portsmouth, Rhode islands, area and 4.2 million tons in Plainville, Machusetts These estimates are based on USGS recommended methods for resource determination. The cost of finding this material, based on the cost of the contracts, comes out to be approximately 1.5 cents per ton DOF

N82-11520# Royal Norwegian Council for Scientific and Industrial Research, Oslo

PLAN FOR TECHNOLOGICAL RESEARCH AND DEVELOP-MENT RELATED TO THE PETROLEUM ACTIVITIES ON THE NORWEGIAN CONTINENTAL SHELF. 1981-1985: PENDIXES: 1. TECHNICAL CHALLENGES. 2. RESEARCH REQUIREMENTS. 3. HIGH PRIORITY PROGRAMS 10 May 1980 171 p

(DE81-904014, NP-1904014) Avail NTIS HC A08/MF A01 The environmental and geographical conditions on the Norwegian Continental Shelf (NCS) which may effect field exploration and development philosophy or the choice of

technological solutions are identified. Research requirements are described in the areas of physical environment, petroleum exploration, petroleum technology, production technology, sub-sea production systems, platforms and supporting equipment, storage and offshore loading, pipelines, underwater support functions; above-water support functions, automation in offshore production and transportation, communications and positioning, materials and corrosion protection, quality assurance, and regulations. High priority programs were defined based on the general objectives of the national petroleum policy, resource management, safety, industrial development, and cost reduction DOE

N82-11523# Boston Coll., Weston, Mass Dept of Geology and Geophysics

OF COAL AND ANTHRACITIC CAR-EXPLORATION. BONACEOUS SHALE RESOURCES, NARRAGANSETT BASIN, MASSACHUSETTS, AND RHODE ISLAND Final Report, 1 Oct. 1979 - 30 Arp. 1981

James W Skehan, Greta E Gill, Jonathan D Raben, Norman Schapiro, and Daniel P Murray May 1981 86 p refs (Contract DE-AC01-79RA-20029)

(DE81-030895. DOE/RA-20029/T1) NTIS HC A05/MF A01

Results of continuous core drilling primarily in two contiquous fields to evaluate the carbonaceous resource are presented Geological and analytical results, resource calculations, and evaluations of potential mining methods and conditions are included Results of fieldwork and drilling in the Portsmouth, Rhode Island area defined the coal-bearing structure as being a southerly plunging fold, with the western limb and the eastern holes penetrating the axial portion of the fold. In the Plainville, Massachusetts area, an E-W trending anticline was defined by fieldwork and exploratory drilling. The anthracitic carbonaceous shale seam folded by this structure varies in thickness and ash content along strike

N82-11571# Aerojet Energy Conservation Co., Sacramento, Calif FLUID-BED HEAT-EXCHANGER OPTIMIZATION AND BED **MATERIALS SELECTION Final Report**

Feb 1981 127 p refs (Contracts DE-AC22-78ET-11343, DE-AC03-79ET-11343,

ET-78-C-03-2039)

(DOE/ET-11343/T2, Rept-8100-F8-0003) NTIS HC AO7/MF AÓ1

The effect of material properties on heat exchanger costs for waste gas streams from 500 to 30000F was evaluated. The cost of the major heat exchanger components was identified and related directly to bed material properties. Two hundred materials were reviewed metals, alloys, oxides, minerals, carbides, borides, intermetallics, and cermets. It is shown that the oxides and minerals were the most cost effective at the lower bed temperatures and the metallic bed materials at the higher bed temperature

N82-11573# Argonne National Lab , III Energy and Environmental Systems Div

PRELIMINARY EVALUATION OF ADVANCED COAL-BASED ELECTRICITY-GENERATING TECHNOLOGIES BY MEANS OF SYSTEM-INTEGRATION ANALYSIS

J L Gillette and K Hub Apr 1981 41 p refs (Contract W-31-109-eng-38)

ANL/EES-TM-144) (DE81-029989. Avail HC A03/MF A01

The potential effects of coal fired cogeneration on production requirements were examined. Two types of cogeneration designs, a backpressure turbine and an extraction turbine were studied It is found that some savings of oil can be realized with coal based cogeneration, and that the quantity of such is dependent on the purchase option, the demand growth rate, and the cogenerator design. It is concluded that of the two designs the backpressure turbine type has an advantage due to its significantly lower heat rate

N82-11588# Princeton Univ. N J

IS GEOTHERMAL SIMULATION A CATASTROPHE?

V Nguyen and George F Pinder 1980 5 p refs_Presented at 6th Ann Workshop on Geothermal Reservoir Engr., Stanford, Calif, 16-18 Dec 1980 (DE81-026750. CONF-801233-10) Avail

HC A02/MF A01

NTIS

All numerical simulators of geothermal reservoirs depend upon an accurate representation of the thermodynamics of steam-water systems. These relationships are required to render tractable the system of balance equations derived from the physics of flow through porous media. While it is generally recognized that steam-water system (i.e., two phase) is not thermodynamic equilibrium, equilibrium thermodynamics are employed in its description. An alternative view based on non-equilibrium thermodynamics is presented. The underpinnings of this approach are found in a branch of topology generally referred to as catastrophe theory

N82-11611# Midwest Research Inst., Golden, Colo Solar Energy Research Inst

OCEAN ENERGY-WAVES, CURRENTS, AND TIDES

J Miles and B Shelpuk May 1981 11 p refs Presented at Energy in the Man-Built Environ Urban Planning and Develop Div Spec Conf., Vail, Colo., 3-5 Aug. 1981

(Contracts DE-AC02-77CH-00178, EG-77-C-01-4042)

(DE81-025708, SERI/TP-634-1195, CONF-81080808) Avail NTIS HC A02/MF A01

An overview is presented on the mechanical forms of ocean energy, i.e., waves, currents, and tides. Following an introductory section on wave mechanics, each of the three forms of ocean energy is considered under the headings of the resource, device types for energy extraction, and prognosis for practical implementation

N82-11683 Colorado Univ at Boulder

GEOLOGY OF THE NAHCOLITE DEPOSITS AND ASSOCI-ATED OIL SHALES OF THE GREEN RIVER FORMATION THE PICEANCE CREEK BASIN, COLORADO Ph D Thesis

John Richard Dyni 1981 182 p

Avail Univ Microfilms Order No 8122279

Stratigraphic and lithologic studies of drill cores from 10 exploratory holes reveal that five eights of the nahcolite resource. occurs as crystalline aggregates in maristone. The remainder of the resource consists of laterally continuous zones of disseminated nahcolite in maristone and beds of mixed nahcolite and halite Sedimentologic data indicate that the maristones and associated sodium minerals were deposited by pelagic, turbiditic, and evaporitic processes in a permanent alkaline lake Lower lake waters and sediments favored high rates of bacterial reduction of sulfate and hydrolysis of fine grained detrital silicate minerals These processes resulted in production of bicarbonate and the formation of an authigenic suite of carbonate and silicate minerals devoid of clay and sulfate minerals. Cyclic probably seasonal, stratification is recorded by the laminated maristones and in some units of disseminated and bedded nahcolite and halite

04 FUELS AND OTHER SOURCES OF ENERGY

The vertical distribution of total sulfur in the maristones is also cyclic and may be related to evaporative phases of the lake Dissert Absti

N82-11715# Los Alamos Scientific Lab , N Mex RELAXATION OF GEOTHERMAL-RESERVOIR STRESSES INDUCED BY HEAT PRODUCTION

H Murphy, ed., R Aamodt, H Fisher, T Grant, C Grigsby, R Hendron, H Keppier, C Pearson, R Potter, and G Suhr Aug 1981 34 p refs

(Contract W-7405-eng-36)

(DE81-032024, LA-8954-MS) Avail NTIS HC A03/MF A01 Fifteen million kWh of thermal energy were produced during 281 days of operation of the hot dry rock (HDR) geothermal reservoir at Fenton Hill, New Mexico Following this heat production the thermal stresses and strains so were partially released by a shot. 7-h pressurization of the reservoir above the local tectonic confining stress. Following the partial stress release, it was found that the resistance to water flow through the reservoir was decreased by 37 percent, and that the reservoir volume, as measured by tracer studies, increased by 43 percent. Microseismic events recorded with geophones in two deep wells at positions within a few hundred meters of the reservoir were concentrated in those regions of the reservoir most affected by thermal depletion These events define a reservoir region and size in qualitative agreement with estimates based upon heat production model-

N82-12156 Arizona Univ , Tucson

FUEL NITROGEN CONVERSION DURING FUEL RICH COMBUSTION OF PULVERIZED COAL AND CHAR Ph.D. Thesis

James William Glass 1981 334 p

Avail Univ Microfilms Order No 8121921

The conversion of coal and char nitrogen is investigated during fuel rich combustion. The roles of NO, HCN, and NH3, and char nitrogen in the post combustion gases in the first, fuel rich stage of a staged combustor are clarified. The fuel rich conversion of char nitrogen show that at all stoichiometries, the concentrations of HCN and NH3 in the post time gases are small compared to the concentration of NO Char nitrogen conversion is stoichiometric or greater Destruction of NO is found to be controlled by a heterogeneous mechanism involving the char carbon surface. The mechanism is deactivated by Dissert Abstr

N82-12182# Georgetown Univ , Washington, D.C INDUSTRIAL APPLICATION OF FLUIDIZED-BED COMBUS-TION Quarterly Technical Progress Report, Jan. - Mar 1981

1981 123 p

(Contract DE-AC21-76ET-10381)

(DE81-030272. DOE/ET-10381/197) Avail. NTIS

HC A06/MF A01

An atmospheric fluidized bed boiler using high sulfur coal functioning as a source of steam was constructed and is operated as a demonstration plant. Operations since start up are summarized Boiler thermal efficiency is low Factors affecting efficiency are discussed.

N82-12187# Energy and Environmental Research Corp., Santa Ana, Calif

ASSESSMENT OF PULVERIZED-COAL-FIRED COMBUSTOR PERFORMANCE Quarterly Progress Report, 1 Apr. - 30 Jun. 1981

W Richter, W Clark, and R Payne Jul 1981 28 p refs (Contract DE-AC22-80PC-30297)

(DE81-030860; DOE/PC-30297/T4, QPR-3) Avail NTIS

HC A03/MF A01

This program is concerned with the provision of a technology base to expedite the conversion of industrial processes from oil and gas to coal and other pulverized fuels. It addresses primarily the impact of fuel type on the thermal performance of a combustor The program incorporates two experimental tasks and is constructed around an analytical task (Task 1) which will identify and upgrade a family of computer programs required to undertake thermal performance analysis studies. These anaytical tools will thus be used to predict the effects of parameters such as fuel type and furnace variables on combustor performance. and to identify those properties which have a major impact on thermal performance. The second task uses a combustion reactor to screen the key variable identified in Task I and to provide

data on the properties of coal particulate matter which affect heat transfer performance. Verification of the engineering analytical approach will be provided by measurements made in a pilot-scale furnace in the third task. Progress is reported.

N82-12194# Wisconsin Univ , Madison Dept of Mechanical Engineering
COAL COMBUSTION IN HIGH CONVECTIVE FLOWS
Progress Report, 1 Mar. - 31 Aug. 1981
Kenneth W Ragland 8 Sep 1981 6 p
(Contract DE-FG22-80PC-30213)
(DE81-030391. DOE/PC-30213/T1) Avail NTIS

HC A02/MF A01

Fundamental data on ignition delay, volatile burn time, volatile reactivity, char burn time, char reactivity, aerodynamic drag, particle surface temperature, and internal porosity of burning coal particle are being obtained as a function of coal type, particle size, gas temperature, gas velocity and oxygen concentration Simulation of conditions inside a furnace has been achieved in two test rigs which have been constructed in the first rig single coal particle 3 to 12 mm diameter are suspended on a 0 02 mm diameter stainless steel wire which extends from an electronic balance into a 5 mm diameter tube containing flowing electrically heated gas. This setup extends the traditional thermogravimetric analysis to flowing systems. In the second rig coal particles are levitated freely in a 50 mm diameter diverging insulated quartz nozzle. To data 16 fixed particle test runs have been made-7 with a Kentucky bituminous coal, 3 with a Montana sub-bituminous and 6 with a Texas lignite. Gas temperture ranged from 760 to 11400K, flow rates 2 to 11 scfm, gas-particle velocities from 18 to 104 m/s, and Reynolds numbers from 100 to 1150

N82-12196# Cornell Univ , Ithaca, N Y
PYROLYSIS OF COAL-DRIVED FUELS USING THE LASERPOWERED HOMOGENEOUS PYROLYSIS TECHNIQUE
Technical Progress Report, 5 Aug. 1980 - 31 Jul. 1981
P C T deBoer 31 Jul 1981 19 p refs
(Contract DE-FG22-80PC-30217)
(DE82-000251, DOE/PC-30217/T2) Avail. NTIS
HC A02/MF A01

The progress made can be divided into two areas theoretical work leading to an accurate computation of the temperature and velocity fields in the sample cell, and experimental work studying various chemical reactions involving hydrocarbons. The laser-powered homogeneous pyrolysis (LPHP) technique was applied to the unimolecular decomposition of 1,4-cyclohexandiene to benzene and hydrogen and of 1-chloropropane (n-propylchloride) to propene and hydrogen chloride as well as to the isomerization of cis-2-butene to trans-2-butent. These reactions proceed in different temperature ranges, with reaction rates that are well known. The temperature range covered is 575 to 8500K. The objective of this investigation was to establish proper operation of the LHLP technique over the temperature range of interest for the pyrolysis of coal-derived hydrocarbons. A set of equations was derived describing the motion of the strongly heated gas in the sample cell. The equations take account of the variations of viscosity and thermal conductivity with temperature, as well as of the dependence of the radiation absorption coefficient on temperature and density DOE

N82-12197# Pittsburg and Midway Coal Mining Co , Englewood, Colo

 SOLVENT-REFINED
 COAL (SRC)
 PROCESS
 Final Report

 Aug
 1981
 87 p refs
 (Contract DE-AC05-76ET-10104)
 Avail
 NTIS

 (DE81-031937.
 DOE/ET-10104/12)
 Avail
 NTIS

HC A05/MF A01

In late 1979 the Pittsburgh and Midway Coal Mining Co, recommended to the Department of Energy that certain areas of the SRC Pilot Plant should be modified to represent the SRC-II Demonstration Plant design The proposed modifications were for design confirmation, start-up, transient and other operational guidance studies, and training of operator and professional personnel The pilot plant facilities proposed for modification were Coal Slurry Mixing - Area 01, Dissolver Effluent Cooling and Separation - Area 02, and Vacuum Flash/Residue Pump Testing - Area 04 A summary justification assessment for the modifications is included A preliminary engineering study by Badger Energy, Inc. was completed in late 1980. A proposed to begin detailed engineering had been submitted to DOE

for approval when all work was discontinued at the direction of the DOE in April 1981 DOE

N82-12198# Montana State Univ , Missoula
CATALYTIC HYDROGENATION OF COAL-DERIVED
LIQUIDS Interim Report, Mar. - May 1981
Lloyd Berg and F P McCandless Jul 1981 50 p
(Contracts EX-76-C-01-2034; DE-AC22-76ET-10495)
(DE81-030485, DOE/ET-10495/T2, FE-2034-23) Avail NTIS
HC A03/MF A01

Two runs of more than 100 hours of catalyst life were completed using SRC-I and SRC-II as the feeds One run had catalyst regeneration every three hours, the other every eight hours The catalyst, 4% CoO, 8% MoO3, 1% NiO and 8% WO3 on NALCO-78-6008C alumina base, reduced the nitrogen content to less than 0.3% showed no signs of deterioration in activity Regeneration after the three or eight hour periods was by burnoff with oxygen in nitrogen followed by re-sulfiding with H2S in hydrogen The liquid yield from SRC was 90% of which 30% was 50 to 2040C boiling range gasoline. It appears that a viable process to convert SRC into a feedstock acceptable to a petroleum refinery was discovered. A study of the effect of carbon laydown on pore volume and subsequent deactivation of the catalyst was carried out in a pressurized batch reactor. Little reduction in pore volume was noted. Three commerical catalysts, Harshaw HT400, NALCO MO477 and NALCO MN502, were evaluated with SRC-II.

N82-12199# California Univ. Berkeley
Lab Energy and Environment Div
OXYDESULFURIZATION OF COAL BY ACIDIC IRON
SULFATE SOLUTIONS M.S. Thesis
David A Mixon and Theodore Vermeulen Aug 1981 161 p
refs
(Contract W-7405-eng-48)
(DE82-000464, LBL-9963-Rev) Avail NTIS
HC A08/MF A01

To facilitate by-product recovery and eliminate elemental sulfur formation in coal oxydesulfurization, high-sulfur bituminous coal has been treated with aqueous ferric sulfate/sulfuric acid and oxygen at 100 to 1500C The rate of pyrite oxidation increases with oxygen partial pressure, temperature, and fitness of grinding This reaction rate is relatively insensitive to sulfuric acid and ferric sulfate concentrations, so that pyrite removal may be satisfactorily performed in solutions containing 25% H2SO4 and 12% Fe2(SO4)3 (weight percentages relative to total H2O plus HsSO4), preliminary data suggest that such a leaching solution is only mildly corrosive to T316 stainless steel, at 1500C or below, in the presence of oxygen. To provide an accurate assessment of coal oxydesulfurization stoichiometry, and analytical technique based on uv spectrophotometry has been developed for the determination of elemental sulfur in coal Prepared coal samples are extracted for 24 hours with cyclohexane. Other exploratory oxydesulfurization runs have shown that vanadium oxides are not effective catalysts at 1000C, with oxygen

N82-12200# Utah Univ, Salt Lake City College of Mines and Mineral Industries
INVESTIGATION OF FACTORS AFFECTING THE IN-SITU
COMBUSTION RETORTING OF OIL SHALE Final Report
H Y Sohn, C H Pitt, and A G Oblad 29 May 1981 166 p
refs
(Contracts DE-AS03-78ET-13095, ET-77-S-03-1760,
EF-77-S-04-3909)
(DE82-000482, DOE/ET-13095/T1) Avail NTIS
HC A08/MF A01

Subprocess taking place during an in situ combustion retorting of oil shale were investigated. Some of these subprocesses also occur in a surface retorting process. The specific topics of this research program include (1) experimental determination of the intrinsic kinetics of kerogen decomposition producing oil, (2) mathematical formulation of the retorting of a oil shale block in the presence of heat transfer effects, (3) experimental determination of the intrinsic kinetics of oil shale char oxidation. (4) mathematical modeling of the oxidation of oil shale char in a spent shale block in the presence of heat and mass transfer effects, (5) determination of ignition delay and energy requirements for the ignition of an oil shale bed, (6) determination of thermal expansion of oil shale, and (7) determination of heat capacities of oil shale and the heat of decomposition of kerogen. The results of the investigation of these topics are presented.

of the results have been published in journals which are readily available. In such a case only a brief summary of the results are presented DOF

N82-12236 Dartmouth Coll , Hanover, N H

PARTIAL ACID HYDROLYSIS PRETREATMENT FOR ENZYMATIC HYDROLYSIS OF CELLULOSE: A PROCESS
DEVELOPMENT STUDY OF ETHANOL PRODUCTION Ph.D. Thesis

Diane Ruth Knappert 1981 175 p

Avail Univ Microfilms Order No 8121523

Cellulosic substrates (poplar, corn stover and bagasse) were pretreated in a continuous, plug flow reactor at conditions of 160-220 C, 0-15% acid, and retention times up to 13 seconds The pretreated material was then hydrolyzed with Trichoderma reesei C30 cellulase, for 48 hours Glucose concentrations were measured during the 48 hours of hydrolysis, and results are compared to those from controls, hydrolysis of untreated material Results show a significant increase in glucose yields after pretreatment For example, after pretreatment, glucose yields from hydrolysis of poplar as high as 75% are obtained, compared to 20% yields from hydrolysis of untreated poplar Successful pretreatments are found to solubilize about 40% of the poplar hemicellulose. The cost of producing ethanol using a 10 MM gal/yr plant size are evaluated, and the process is scaled up to a 50 MM gal/yr plant Dissert Abstr

N82-12238 Houston Univ., Tex SOLID-SOLID REACTIONS IN COAL CONVERSION PROCESSES Ph.D. Thesis

Daniel Clark Baker 1981 198 p

Avail Univ Microfilms Order No 8120902

The thermal stability of calcium sulfate and sulfated coal ashes was studied as well as the catalytic effect of metal carbonates on coal char gasfication. Five model reactions which could result in undesirable evolution of sulfur oxides are considered decomposition of pure CaSO4 between 950 C -1130 C, decomposition of CaSO4 in the presence of thin film melts of KCl and NaCl at 1020 C, reactions of CaSO4 with metal oxides in binary systems at 1020 C, reactions of CaSO4 with aluminosilicates in multicomponent systems at 1020 C. and decomposition of sulfated coal and lignite ashes at 820 C and 1020 C Metal carbonates did not change the mechanism of char gasification when CO2 was the reactive gas It was noted that reactions of the solid-solid complex with silicates and aluminosilicates in the ash of the char can result in loss of catalytic activity and poor catalyst recovery

N82-12240* # National Aeronautics and Space Administration Pasadena Office, Calif

HYDRODESULFURIZATION OF CHLORINATED COAL Patent Application

John J Kalvinskas (JPL, California Inst. of Technology, Pasadena) and Naresh K Rohatgi, inventors (to NASA) (JPL, California Inst of Technology, Pasadena) Filed 30 Oct 1981 24 p (Contract NAS7-100)

(NASA-Case-NPO-15304-1, US-Patent-Appl-SN-315587) Avail NTIS HC A02/MF A01 CSCL 21D

A method of desulfurization is described in which high sulfur coals are desulfurized by low temperature chlorinolysis of coal in liquid media, preferably water, followed by hydrodesulfurization at a temperature above 500 C. The coals are desulfurized to an extent of up to 90% by weight and simultaneously dechlorinated to a chlorine content below 0 1% by weight. The product coals have lower volatile loss, lower oxygen and nitrogen content and higher fixed carbon than raw coals treated with hydrogen under the same conditions. Heating the chlorinated coal to a temperature above 500 C in inert gas such as nitrogen results in significantly less desulfurization NASA

N82-12241* | National Aeronautics and Space Administration Pasadena Office, Calif

SUPERCRITICAL MULTICOMPONENT SOLVENT COAL **EXTRACTION** Patent Application

William H. Corcoran, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 30 Oct 1981 27 p (Contract NAS7-100)

(NASA-Case-NPO-15767-1, US-Patent-Appl-SN-315584) Avail NTIS HC A03/MF A01 CSCL 21D

The yield of organic extract from the supercritical extraction of coal with larger diameter organic solvents such as toluene is

04 FUELS AND OTHER SOURCES OF ENERGY

increased by use of a minor amount of from 0.1 to 10% by weight of a second solvent such as methanol having a molecular diameter significantly smaller than the average pore diameter of

N82-12242# General Accounting Office, Washington, D C STATUS OF THE GREAT PLAINS COAL GASIFICATION PLANT

16 Mar 1981 30 p (EMD-81-64) Avail NTIS HC A03/MF A01

A coal gasification plant with a production capacity of 125 million cubic feet per day of high Btu gas, equivalent to about 22,000 barrels of oil per day, is proposed for Mercer County, N Dak This synthetic gas is a direct substitute for natural gas. The process employed to convert the coal to gas is the Lurgi pressurized, fixed bed gasification process with Lurgi methanation

N82-12250# Aerospace Corp., El Segundo, Calif. Systems Directorate

PROJECT FOR RELIABILITY FLEET TESTING OF ALCOHOL/ **GASOLINE BLENDS Technical Progress Report** Jul 1981 85 p refs

DOE/CS-50023/T15) (DE82-000004)

HC A05/MF A01

Progress is reported in reaching the near-term goal of bringing the end-use technology for formulated alcohol/gasoline blends to the point of commercial technical readiness, in support of the Alcohol Fuels Program element of the DOE Alternative Fuels Utilization Program (AFUP) Activities considered include acquiring data for proof-of-concept through engineering tests in a small controlled fleet using various formulated blends of ethanol/ gasoline and methanol/gasoline as well as for statistical proof-of-performance through large-scale reliability fleet tests using selected blends Implementation of the 4-year plan is continuing in accordance with funding availability

N82-12251# United Technologies Corp., South Windsor, Conn. Power Systems Div

EVALUATION OF SHALE OIL AS A UTILITY GAS-TURBINE FUEL Final Report

A P Grasso, R A Sederquist, F G Sykes, J Frese, J McVey, G Lewis (Pratt and Whitney Aircraft, West Palm Beach, Florida), and J Mathason (Pratt and Whitney Aircraft, West Palm Beach, Florida) Aug 1981 139 p refs Sponsored by Electric Power Research Inst

(EPRI Proj 1691-2)

(DE81-904234. EPRI-AP-1975)

NTIS Avail

HC A07/MF A01

An FT4A-9 engine and a selected single-can combustor from an O engine were tested using No 2 petroleum distillate fuel and hydrotreated Paraho shale oil residual, with and without water injection. The engine operated successfully with low smoke when running on shale oil residual and No 2 petroleum distillate fuel. The use of hot water injection was successfully demonstrated with reduced No/sub x/ emissions when operating on both fuels. Post-test engine inspection showed that all combustor components, including turbine inlet vanes, were in good condition No/sub x/ emissions from single-can combustor testing with both fuels exceeding engine levels. Carbon monoxide and unburned hydrocarbons were slightly lower

N82-12254# Boeing Engineering and Construction, Seattle,

Wash Engineering and Construction Div FEASIBILITY AND ECONOMIC STUDY OF MEDIUM-Btu COAL GAS BLENDED WITH HIGH-Btu BY-PRODUCT GAS AS AN INDUSTRIAL ENERGY SOURCE AT BILLINGS. MONTANA Final Report

May 1981 297 p refs Prepared in cooperation with Northern Resources, Inc., Billings, Mont.

(Contract DE-FG01-79RA-20219)

(DE81-030622, DOE/FE-20219/2)

NTIS Avail

HC A13/MF A01

The technical and economic feasibility of blending a medium Btu gas (MBG) produced from coal by the Winkler fluidized bed gasification process with excess refinery fuel gas to be used as an industrial fuel in Billings, Montana is assessed. The background of the project, the site selection process, the conceptual design of the process and supporting facilities, the retrofit requirements and other costs associated with burning the MBG, the environmental and permitting aspects of the project, the cost estimates and economic considerations, the contract provisions for MBG buy/sell agreements, the government's role in supporting the project, and the market potential for the project in Billings and similar projects in other markets are discussed. The project is technically feasible and economically viable today although parity with conventional fuels will not occur until 1985 DOE

N82-12255# Brookhaven National Lab , Upton, N Y Catalyst

DEVELOPMENT OF CATALYTIC SYSTEMS FOR THE CONVERSION OF SYNGAS TO JET FUEL AND DIESEL FUEL AND HIGHER ALCOHOLS Annual Report

William A Slegeir Oct 1980 18 p (Contract DE-AC02-76CH-00016)

(DE82-000067, BNL-51423). Avail NTIS HC A02/MF A01 A highly active series of Fischer-Tropsch catalysts are developed on the basis of insights provided by the oxide theory The method of catalyst formulation is unique in Fischer-Tropsch chemistry, yet is simple and reproducible. These catalysts are superior to ordinary catalysts for hydrocarbon synthesis with regard to rate, operating conditions, and, product selectivity and longevity The products of these catalysts are ideally suited for use as diesel and jet fuels. Once formed, the catalysts display remarkable stability toward air Oxide interactions, the role of promoters, and the synergistic behavior of bimetallic catalysts systems are studied Bimetallic systems for hydrocarbon and alcohol synthesis are discussed

N82-12259# Pittsburg Energy Technology Center, Pa SYNTHESIS GAS CONVERSION TO LIQUID FUELS USING PROMOTED FUSED IRON CATALYSTS

Richard A Diffenbach, Richard R Schehl, and Daniel J Fauth Sep 1981 67 p refs

(DE81-030857, DOE/PETC/TR-81/3) HC A04/MF A01

More active and stable nitrided iron catalysts were prepared for the conversion of synthesis gas to a proudct with a high alcohol content that could be used directly as an automotive fuel or converted to a gasoline-like product over a shape selective zeolite in a dual reactor unit. The rational is given for the preparation of a molybdenum-promoted nitrided fused ion catalyst Catalyst characterization yielded equivocal results as to whether a mixed Fe-Mo nitride was formed Regardless of the nature of the Mo-containing species, these catalysts were significantly more active than unpromoted nitrided fused iron catalyst. Characterization of fused iron catalysts using thermogravimetric analysis indicated the rates of reduction, carburization, and nitriding were strongly dependent on reaction temperature and particle size as well as the nature of the promoter X-ray diffraction measurements indicated the metal crystallite size of the reduced catalysts was strongly dependent on reduction temperature DOE

N82-12260# Institute of Gas Technology, Chicago, III DEVELOPMENT OF HYDROCONVERSION OF BIOMASS TO SYNTHETIC FUELS Technical Progress Report, 1 Jan. 31 Mar. 1981

Jul 1981 56 p refs (Contract DE-AC02-80CS-83004)

(DE81-030954, DOE/CS-83004/3)

HC A04/MF A01

The physical and chemical characterization data for Douglas fir hog fuel, maple hardwood, and corn stover are presented for comparison Fluidization parameters were obtained for mixtures of char and hollow alumina spheres (-25 + 60 mesh) as the inert bed material. The driving characteristics of maple hardwood were measured isothermally in the range of 2000 to 4000 F Three distinct moisture content regions were observed with different characteristic drying behaviors. Size reduction characteristics show that the throughput rate for various product screen sizes is lower for the moist, as-received feed than for the dried feed material. The hydrodevolatilization data of maple hardwood from the rapid heat-up rate, free-fall apparatus were analyzed Comparison of the steam-char gasification rates of coal, peat, and maple hardwood chars shows that the reactivity level expected of the biomass char is significantly higher than that of coal and peat DOE

N82-12261# Department of Energy, Morgantown, W Va FIXED-BED GASIFICATION Jan. 1981 29 p refs

(DE82-000432) DOE/METC/SP-184) HC A03/MF A01

Avail NTIS

Since the completion of construction in 1967, the METC Gasifier Pilot Plant has produced data and demonstrated operation on all major ranks of US coals. In 1976, METC began an expansion program to include a novel gas-cleanup facility to evaluate the environmental problems associated with gasification plants and also to develop improved cleanup systems. The construction and checkout of this full-scale cleanup system was completed within the past year and the pilot-plant facility now has the capability of gasifying all US coals and producing a relatively tar, oil, particulate, and sulfur free fuel gas. The Department of Energy's (DOE) fixed-bed gasification evelopment program includes other facilities that provide DOE with a broad capability to address alternative and advanced gasification technologies. In addition to utilizing these facilities to evaluate and improve gasification/ cleanup configurations, the pilot plants are also being used to support a number of related projects DOE

N82-12262# Argonne National Lab , III DENSITY-MEASUREMENT STUDIES AT THE BI-GAS PILOT PLANT

S H Sheen and A C Raptis Sep 1981 17 p refs (Contract W-31-109-eng-38) NTIS ANL/FE-81-57) (DE82-000910. Avail HC A02/MF A01

An acoustic flow/no-flow monitor for the char return line of the BI-GAS pilot plant was developed. The indicator has operated successfully for the last three years. It was observed that the strength of the microphone signal is related to the amount of char in the line. In a recent experiment at BI-GAS this observation was further explored, and it was found that the signal is related to the char valve opening in the frequency range of 1 to 20 kHz This is a clear indication that the flow/no-flow indicator can be upgraded to a density meter and consequently to a true mass flowmeter. This can be done by installing another flow/no-flow indicator upstream or downstream of the existing one and cross-correlating the two signals DOF

N82-12263# Oak Ridge National Lab. Tenn SELECTIVE SEPARATION OF COAL FEEDSTOCKS FOR CONVERSION BY MAGNETIC SEPARATION NIQUES

E C Hise and A S Holman 1981 8 p refs Presented at 91st Natl Meeting of the Am Inst of Chem Engr., Detroit 16 Aug 1981

(Contract W-7405-eng-26)

(DE81-028060, CONF-810814-6) **NTIS** HC A02/MF A01

The Open-Gradient Magnetic Separation (OGMS) technique can separate particles on the basis of small differences in magnetic susceptibility. The highly reactive coal macerals are diamagnetic while the minerals and less reactive macerals range from slightly diamagnetic to paramagnetic with the pyritic minerals exhibiting the greatest positive magnetic susceptibility OGMS can spread a falling stream of fine coal into a spectrum permitting the physical separation of these several maceral and mineral groups Several eastern bituminous coals were selectively separated into five to ten fractions. Petrographic examination of these separated fractions shows a concentration of the maceral and mineral groups in the appropriate fractions It is proposed that the selective separation of the most reactive macerals, as well as of those minerals that exhibit a catalytic effect, can enhance the efficiency of coal conversion

N82-12264# California Univ. Livermore Lawrence Livermore Lab

DESIGNING PROCESS WELLS FOR AN UNDERGROUND **COAL-GASIFICATION ENVIRONMENT**

D S Thompson Jun 1981 20 p refs Presented at 7th Underground Coal Conversion Symp, Fallen Leaf Lake, Calif. 8 Sep 1981

(Contract W-7405-eng-48)

(DE81-028434; UCRL-85839, CONF-810923-7) Avail NTIS HC A02/MF A01

The reasons why process well integrity is important are covered in a review and evaluation of significant data generated from various field tests, including identification of well failure mechanisms. A close relationship is observed between process well behavior and process performance. As a logical extension of this evaluation, design and performance criteria for under-

NTIS

ground coal gasification (UCG) process wells are developed Applications to the next generation of field tests are presented in the form of proposed design features for UCG process wells, features intended to prevent the failure modes that have occurred in past field experiments.

N82-12400# Oak Ridge National Lab , Tenn Chemical Technology Div

MEASUREMENT OF THERMAL CONDUCTIVITIES IN COAL FLUIDS

C S Chang, J B Bader, and J L Plawsky Sep 1981 52 p refs

(Contract W-7405-eng-26)

(DE82-000523. ORNL/MIT-334), Avail. NTIS

HC A04/MF A01

As a qualification of a transient hot wire, thermal conductivity cell for use on the Coal Liquids Flow System, the thermal conductivity of toluene was mesured between 25 and 850 C Static measurements over a 4-sec time span yielded a thermal conductivity at 250 C of 0 12607 W/m-K and a slope of thermal conductivity vs temperature of -2728 W/m-K (squared) All results are within 2 to 5% of the most recent literature data An experimental error analysis showed all errors to be less than 1% Dynamic-mode measurements in which flow through the cell was interrupted only for the measurement period agreed within experimental accuracy with the static-mode measurements, demonstrating that the hot-wire cell is immediately applicable to coal-slurry thermal-conductivity measurements in the Coal Liquids Flow System Sedimentation experiments showed that settling should have a negligible effect on thermal-conductivity measurements over the time period envisioned for measurement Excellent agreement was obtained between previous measurements of thermal conductivities of coal slurries and the predictions of the Rayleigh equation for heterogeneous-mixture thermal conductivities

N82-12514# University of Southern California, Los Angeles Dept of Petroleum Engineering

FORMATION EVALUATION IN LIQUID DOMINATED GEOTHERMAL RESERVOIRS

Iraj Ershaghi, Elmer E Dougherty, and Lyman L Handy Apr 1981 106 p refs

(Contracts DE-AT03-76ET-28384, EY-76-S-03-0113) (DOE/ET-28384/T1) Avail NTIS HC A06/MF A01

Studies relative to some formation evaluation aspects of geothermal reservoirs are reported. The particular reservoirs considered were the liquid dominated type with a lithology of the sedimentary nature. Specific problems of interest included the resistivity behavior of brines and rocks at elevated temperatures and studies on the feasibility of using the well log resistivity data to obtain estimates of reservoir permeability. Brine viscosity data at elevated temperatures, effect of dissolved gases on brine resistivity, design of a modified API filter test apparatus, and modeling of filter cake buildup during drilling are discussed.

N82-12516# Union Oil Co. of California, Los Angeles Geothermal Div

GEOTHERMAL RESERVOIR ASSESSMENT: NORTHERN BASIN AND RANGE PROVINCE STILLWATER PROSPECT, CHURCHILL COUNTY, NEVADA Final Report, Apr. 1979 -Jul. 1981

D L Ash, R F Dondanville, and M S Gulati Aug 1981 35 $\rm p$

(Contract DE-AC08-79ET-27012)

(DE82-000529. DOE/ET-27012/1) Avail NTIS

HC A03/MF A01

The two wells were drilled to total depths of 6946 ft and 10.014 ft with no significant drilling problems. A maximum reservoir temperature of 353 F was measured at 9950 ft. The most productive well flow tested at a rate of 152,000 lbs/hr with a wellhead temperature of 252 F and pressure of 20 psig Based upon current economics, the Stillwater geothermal prospect is considered to be subcommercial for the generation of electrical power. This synopsis of the exploratory drilling activities and results contains summary drilling, geologic, and reservoir information from two exploratory geothermal wells.

DOE

N82-12517# California Dept of Conservation, Sacramento Div of Mines and Geology

04 FUELS AND OTHER SOURCES OF ENERGY

GEOPHYSICAL SURVEY, PASO ROBLES GEOTHERMAL AREA, CALIFORNIA, PART OF THE RESOURCE ASSESS-MENT OF LOW- AND MODERATE-TEMPERATURE GEO-THERMAL RESOURCE AREAS IN CALIFORNIA Progress Report, 1979 - 1980

R H Chapman, Gordon W Chase, and Les G Younds 10 Nov 1980 42 p refs

(Contract DE-FG03-79ET-37035)

(DE81-026038. DOE/ET-37035/T2) Avail NTIS

HC A03/MF A01

Some general background information concerning the geology and geothermal occurrences in the Southern Coast Ranges is included, as well as the more detailed information dealing with the Paso Robles area proper Results from ground magnetic and gravity surveys, are discussed and interpreted. There is possible correlation in some places with known and suspected faults. There are also suggestions of local differences in the Tertiary rocks.

N82-12518# California Dept of Conservation, Sacramento Div of Mines and Geology

RESOURCE ASSESSMENT OF LOW AND MODERATE-TEMPERATURE GEOTHERMAL WATERS IN CALISTOGA, NAPA COUNTY, CALIFORNIA Progress Report, 1979 -1980

Les G Youngs, C Forrest Bacon, Rodger H Chapman, Gordon W Chase, Chris T Higgins, Hasmukhrai H Majmundar, and Gary C Taylor 10 Nov 1980 394 p refs

(Contract DE-FG03-79ET-37035)

(DE81-025559, DOE/ET-37035/T1) Avail NTIS

HC A17/MF A01

The USGS Geotherm file for California was updated and completed and the final data were compiled for a geothermal resources map of the State The methodology used to determine the depth, configuration, flow rate, capacity, water quality, and location of the hottest water in the reservoir at Calistoga is described. The historical use of the resource is reviewed. Other aspects considered include general geology, magnetic surveys, gravity surveys, seismic reflection, and electrica resistivity of the resource. The hydrology and groundwater quality are related to the geological structure and formation as well as to resource assessment. The development of models for volume and temperature, and explatory drilling are also discussed.

N82-12523# Office of Energy Resources, Augusta, Maine
PEAT RESOURCE EVALUATION: STATE OF MAINE
Quarterly Report

NTIS

NTIS

Joel Davis and Walter Anderson 1981 7 p

(Contract DE-FG18-79FC-14690)

(DE82-000227, DOE/FC-14690/T1) Avail

HC A05/MF A01

The amount and location of fuel-grade peat that may be harvested and utilized in an environmentally acceptable manner in Maine were surveyed. The resources inventory provides a detailed evaluation of the peat deposits including maps showing areal extent, thickness, and distribution of peat, stratigraphic cross sections, and surficial mapping. Many deposits were visited to accurately assess the physical characteristics of the deposits and to obtain laboratory samples. Representative samples from surveyed deposits are obtained through standard field sampling techniques.

N82-12524# North Carolina Univ, Chapel Hill Dept o Geology

PEAT DEPOSITS OF DISMAL SWAMP POCOSINS: CAMDEN, CURRITUCK, GATES, PASQUOTANK, AND PERQUIMANS COUNTIES, NORTH CAROLINA

R L Ingram and Lee J Otte, (Kent State Univ., Ohio) Jul 1981 31 p refs

(Contract DE-AC01-79ET-14693)

(DE81-029642, DOE/ET-14693/T3) Avail

HC A03/MF A01

The presence of peat is examined in the Dismal Swamp of northeastern North Carolina and southeastern Virginia. The deposits in North Carolina occupy an area of 76,800 acres containing about 68 million tons of moisture free peat. The deposits greater than 4 ft thick occupy an area of 34,700 acres containing about 43 million tons of peat. The surface elevation of the peat ranges from 15 to 20 ft. Two main types of peat are present. (1) a brown, decomposed fibrous peat usually found at the base of the thicker peats, and (2) a black, fine grained,

highly decomposed peat that usually overlies the fibrous peat Both peat types contain large amounts of wood. The moisture content ranges from 40 to 94% and usually increases with depth and total thickness of the peat It is found that heat values for moisture free, low ash peats range from 8700 to 10,900 Btu/lb and the sulfur content ranges from 0.2 to 0.7%

N82-12584# Century Engineering, Inc., Towson, Md EVALUATION OF LANDFILL GAS AS AN ENERGY SOURCE

Dec 1980 45 p refs (Contract DE-FG02-78IR-05106) (DE82-000116: DOE/IR-05106/T47) NTIS HC A03/MF A01

The benefits and problems associated with landfill gas recovery were considered by the City of Baltimore, resulting in the structuring and testing of a realistic gas recovery evaluation procedure for use by local governments. The Baltimore methodology is summarized and results of its application to a large landfill in the Baltimore area are presented. The landfill gas generation process potential uses for the recovered gas, and treatment requirements are covered

N82-12595# Mid-American Solar Energy Complex, Minneapolis,

MASEC INDUSTRIAL FUEL-WOOD PROGRAM

M Hohmann Jul 1981 46 p refs (Contract DE-AC02-79CS-30150)

(DE82-000461, MASEC/R-81-062, B-101-3) Avail. NTIS HC A03/MF A01

The program is designed not only to identify technical and institutional barriers to the use of wood for fuel, but to effectively reduce these barriers and the economic uncertainty they cause by providing business and industry with the type of information they need for preliminary planning purposes. Information on resource availability, the types of equipment needed, sources of technical assistance, and the financial aspects of the potential investment are provided. A listing of existing wood-fired systems is also included. A key component of the program is a net-cashflow analysis based upon a life-cycle economic model that is used to evaluate new and retrofit wood-fired boiler installations

N82-12596# Battelle Columbus Labs , Ohio

ENERGY RECOVERY FROM MUNICIPAL SOLID WASTE AND SEWAGE SLUDGE USING MULTI-SOLID FLUIDIZED BED COMBUSTION TECHNOLOGY

Jul 1981 210 p refs (Contract DE-AC01-78CS-20424) DOE/CS-20424/1) (DE82-001142.

NTIS

NTIS

HC A10/MF A01

The concept is to recover energy as high and low pressure steam, simultaneously. High pressure steam would be generated from flue gas using a conentional tubular boiler. Low pressure steam would be generated by direct contact drying of DSS (as 4 percent solids) with hot sand in a fluidized bed that is an integral part of the MS-FBC process. It is proposed that high pressure steam could be used for district heating or electricity generation. The low pressure steam could be used for close proximity building heat. The results of the investigation show that the MS-FBC process concept for the co-utilization of MSW and DSS is technically feasible and that the thermal efficiency of the process is 76 to 82 percent based on experiments conducted in 8 70 to 85 lb/h pilot plant and calculations on three conceptual cases

N82-12605# United Technologies Corp., South Windsor, Conn. DESIGN, CONSTRUCTION, AND OPERATION OF A FULL SCALE EXPERIMENTAL ANAEROBIC FERMENTATION FACILITY Final Report Jun 1981 235 p

(Contract DE-AC01-77ET-20009)

(DE81-029028, DOE/ET-20009/T1) Avail

HC A11/MF A01

A 25 ton per day anaerobic fermentation facility was designed to evaluate the technical and economic viability of producing fuel gas and an animal refeed product from the residues of an environmental beef cattle feedlot. The system has been in continuous operation and has been producing between 3 to 5 cubic feet of methane per pound of volatile solids fed to the system Product gas is successfully utilized in (1) the system process boiler which maintains thermophilic operating temperature

in the fermentors, (2) a meat packing plant process boiler, coffred with fuel oil. (3) and a 440 kW grid connected engine/generator system. Feeding trials that will establish the value of the dewatered effluent were performed It is indicated from the initial operation of the system that it will be a technically and economically viable process DOF

N82-12620# Mid-American Solar Energy Complex, Minneapolis,

INTERACTIVE MODEL TO ASSESS ECONOMICS OF ANAEROBIC DIGESTION OF THE FARM

Aug 1981 41 p (Contract DE-AC02-79CS-30150)

(DE82-000452,

MASEC/R-81-068) NTIS Avail HC A03/MF A01

An interactive computer model, to provide economic assessment for on the farm anaerobic digestion systems was designed The model is accessed as part of the MASEC Models Library It consists of two phases engineering analysis and economic analysis. User inputs are stored in a data base and may be retained for future use. Model outputs include a recap of user inputs, calculations for gas production, digester heat requirements, system revenues, yearly cash flow, and a graph of the net present value of the investment. The model is generalized so that nonfarm applications may also be analyzed. The program will work equally well for various digester designs such as continuously stirred reactors, plug flow systems, and fluidized DOF bed columns

N82-12633# Midwest Research Inst., Golden, Colo . Solar Energy Research Inst COSTS FOR ALTERNATIVE GRAIN-RESIDUE-COLLECTION

SYSTEMS Silvio J. Flaim, Bernie Neenan, Jan Dauve, and Harry P. Mapp.

Jr (Oklahoma State Univ., Stillwater) Jun 1981 5 (Contracts DE-ACO2-77CH-00178, EG-77-C-01-4042) 55' p refs (DF81-029072 SERI/TR-734-900) NTIS Avail HC A04/MF A01

The costs for systems for corn and soybean production in lows are examined All machinery field operations, fuel, other inputs, and labor requirements are identified for the base case with no residue harvest, and for residue harvest by stacks and large round bales, with the owner's equipment and for custom harvest. These five cases were developed for corn and soybeans for conventional and reduced tillage practices. Harvesting alternatives are compared on the basis of costs, fuel input requirements, and gross energy balances of residues collected less energy inputs. The cost of collecting corn and soybean residues varies widely over the collection and tillage systems examined Other effects constant, the reduced tillage practice leads to a lower cost of harvest than conventional tillage, and stacks are always cheaper than large round bales, however, the former difference is greater than the latter DOE

N82-12684 Texas Univ at El Paso HEAT FLOW STUDIES AND GEOTHERMAL EXPLORATION IN WESTERN TRANS-PECOS TEXAS Ph.D. Thesis Bruce D, G S Taylor 1981 339 p

Avail Univ Microfilms Order No 8121977

The definition of possible geothermal resources in Trans-Pecos Texas, and a geothermal gradient map of the region are presented. based on nearly 200 temperature and gradient measurements Several areas of high thermal gradient are located, notably in Presidio County, where several hot springs and wells exist Possible mechanisms for the high gradients (and heat flow) here are discussed. A small high gradient area is also indicated in northeast El Paso County, and a geophysical investigation of this prospect is described. The proximity to the city of El Paso made this a prime target for resource evaluation. Geophysical methods employed include gravity, self-potential and electrical resistivity, the surveys culminating in a shallow drilling program to define the areal extent of the anomaly Dissert Abstr

N82-12693# Geological Survey, Washington, D C BIOGEOCHEMICAL EVIDENCE FOR SUBSURFACE HYDROCARBON OCCURRENCE, RECLUSE OIL FIELD, WYOMING: PRELIMINARY RESULTS

Mary C Dalziel and Terrence J Donovan 1980 14 p refs (USGS-CIRC-837) Avail NTIS HC A02/MF A01

Anomalously high manganese to iron ratios occurring in pine. needles and sage leaves over the Recluse oil field, Wyoming,

suggest effects of petroleum microseepage on the plants. This conclusion is supported by iron and manganese concentrations in soils and carbon and oxygen isotope ratios in rock samples Seeping hydrocarbons provided reducing conditions sufficient to enable divalent iron and manganese to be organically complexed or adsorbed on solids in the soils. These bound or adsorped elements in the divalent state are essential to plants, and the plants readily assimilate them. The magnitude of the plant anomalies, combined with the supportive isotopic and chemical evidence confirming petroleum leakage, makes a strong case for the use of plants as a biogeochemical prospecting tool. Author

N82-12731# Geokinetics, Inc., Concord, Calif METEOROLOGICAL AND CLIMATOLOGICAL INVESTIGA-TION: REVIEW OF JANUARY - JUNE 1980 INVESTIGATIVE

D R Lundberg and H K L Spradlin Jul 1981 81 p refs (Contract DE-FC20-78LC-10787) DOE/LC-10787/80) (DE81-030740.

HC A05/MF A01

Since January 1979, a meteorological and climatological investigation for the purpose of establishing a microclimatic baseline has been continuously conducted at the Geokinetics oil shale research facility in eastern Utah This report, however, presents the findings for only a six month segment (January 1 - June 30, 1980) of that ongoing investigation. Included in this report is a description of the program design, the handling and interpretation of the data, and program improvement considerations commended for inclusion into future segments of the investigation

N82-12735# National Academy of Sciences - National Research Council, Washington, D C Maritime Transportation Research Board

MARITIME SUPPORT FOR OCEAN-RESOURCES DEVELOP-MENT Final Report

Jun 1981 188 p refs (Contract N00014-75-C-0711)

(AD-A104730) Avail. NTIS HC A09/MF A01 CSCL 08/10 The issues associated with ocean development to determine their implication for the U.S. maritime industry have been examined The examination embraced ocean energy systems, offshore oil and gas activities, food from the sea, deep seabed mining, and the use of ocean space. The requirements that ocean-resource development places on the maritime industry do not show sharp differences from one resource to the next. While the technological base on which the means of recovery and use of the resources can be built and deployed has been developed, more scientific work and technological development are needed. However, it is the committee's opinion that the true factors pacing the effort to bring many of the resources into use and to achieve the many benefits are of an economic, legal, and public-policy nature

N82-12921# Los Alamos Scientific Lab , N Mex SPACE NUCLEAR SAFETY AND FUELS PROGRAM Progress Report

S E Bronisz, comp Jul 1981 14 p refs (Contract W-7405-eng-36)

Avail NTIS HC A02/MF A01

The use of (238) PuC2 in radioisotope power systems are discussed Impact testing, module handling procedures, and nondestructive test data for encapsulated pellets are reported

N82-12985# Oklahoma Univ., Norman School of Chemical Engineering and Materials Science

DEVELOPMENT OF A THERMODYNAMIC PROPERTIES CORRELATION FRAMEWORK FOR THE COAL CONVER-SION INDUSTRY, PHASE 1A Annual Report, 1 Sep.

1980 - 31 Aug. 1981 K E Starling, L L Lee, K H Kumar, M R Brule, S Watanasiri. V Gupta, M H Li, R McFall, W Chang, C K So et al 1981 33 p ref

(Contract DE-FG22-80PC-30249)

(DE81-030363, DOE/PC-30249/T2, AR-1) Avail NTIS HC A03/MF A01

A three-parameter corresponding states framework developed originally for light hydrocarbons was modified to rapidly develop a practical thermodynamic properties prediction capability for the coal conversion industry. The three-parameter corresponding states correlation describes the thermodynamic behavior of pure nonpolar

04 FUELS AND OTHER SOURCES OF ENERGY

and slightly polar nonassociating coal fluids and mixtures for which the mixture constituents are known Characterization techniques are outlined for converting distillation analysis of underfined mixtures (with composition available in terms of broad fractions) into representative pseudo components Empirical correlations are developed to estimate the three corresponding states characterization parameters for each fraction from measurements made on the fraction (boiling point, specific gravity, molecular weight) Results for one and two ring polar and associating coal fluids indicate that an extension of the corresponding states methodology to associating fluids using a five-parameter correlation is possible

N82-13196# Occidental Research Corp., Irvine, Calif. CONTROLLED-FLASH PYROLYSIS Quarterly Technical Progress Report, Apr. - Jun. 1981

Durai-Swamy, S. C. Che, C. B. Chen, R. Jain, S. S. Kim, and H VonSchonfeldt Aug 1981 55 p refs

(Contract DE-AC22-80PC-30264)

(DE82-000284, DOE/PC-30264/09, QTPR-3) Avail NTIS HC A04/MF A01

Thirteen runs were made in the controlled flash pyrolysis unit with a coal feed rate of about 2 kg/hour. Preliminary material balance for these tests is presented. The laboratory scale (1 gm/min) pyrolysis reactor was used to evaluate several model compounds as quench solvents. Free radical pyrolysis studies, using an electron spin resonance spectrometer, show that vapor phase radicals from coal pyrolysis resemble phenalenyl radical and that char placed on top of the pyrolyzing coal absorbs these vapor phase radicals effectively

N82-13244# California Univ , Livermore Lawrence Livermore Lab

SOVIET UCG EXPERIENCE SPECIFICALLY RELATED TO FIELD EXPERIMENTS IN THE UNITED STATES

D U Olness 8 Jul 1981 6 p refs Presented at 7th Underground Coal Conversion Symp, Fallen Leaf Lake, Calif, 8 Sep 1981 (Contract W-7405-eng-48)

(DE81-028642, UCRL-85919, CONF-810923-6) Avail NTIS HC A02/MF A01

Soviet experiences with problems in underground coal gasification experiments reveal similarities to problems encountered in the United States Aerodynamic considerations and problems with hole failure, override, reverse burn links, and other coal conversion/extraction related difficulties are discussed

MDK

N82-13245# Oak Ridge National Lab . Tenn H-COAL PRODUCT PHYSICAL PROPERTIES MEASURE-MENT Final Report

D D Lee Aug 1981 21 p refs (Contract W-7405-eng-26) ORNL/TM-7915) (DF81-029095 HC A02/MF A01

NTIS

Rheological and density measurements have been made on the H-Coal PDU reactor effluent samples, which used Wyodak coal Characterization was done in the ORNL Coal Liquids Flow System Apparent viscosities and shear rates were observed The rheological data were fitted to both power law and Bingham plastic models. The apparent viscosities appeared to correlate to the amount of solids in the samples

N82-13247# Burns and Roe Industrial Services Corp. Paramus.

LOW/MEDIUM BTU COAL GASIFICATION ASSESSMENT PROGRAM FOR POTENTIAL USERS IN NEW JERSEY: **EXECUTIVE SUMMARY**

May 1981 21 p refs (Contract DE-AC01-79RA-20216)

(DE81-025475. DOE/FE-20216/1) NTIS

HC A02/MF A01 ·

The production of medium Btu quality gas (MBG) for use as fuel for on-site power plant boilers or for distribution to industrial customers appeared to be economically attractive, dependent upon the proximity of sufficient numbers of industrial customers and upon high plant utilization. The Texaco Coal Gasification Process (TCGP) was selected, being a pressurized process capable of supplying the gas without downstream compression. The TCGP could handle the high sulfur eastern coals chosen as a feedstock All equipment downstream of the gasifier was commercially proven. The integration of the gasification process

with a methanol synthesis plant, consuming up to 25% of the MBG produced, was desirable in order to allow storage of MBG during low demand and thereby increase the gasifier capacity factor and minimize its turndown requirements

N82-13248# Combustion Engineering, Inc., Windsor, Conn. LOW-BTU GASIFICATION OF COAL FOR ELECTRIC POWER GENERATION, PHASE 1, 2, AND 3 Monthly Progress Report, 1 Apr. - 30 Apr. 1981

16 Aug 1981 46 p refs (Contract DE-AC01-76ET-10204)

(DE81-029482, DOE/ET-10204/T1, FE-1545-89) Avail NTIS

HC A03/MF A01

Oxygen-enriched operation of the Pressure Distribution Unit was initiated on April 1, 1981. Eleven oxygen enriched gasmaking tests were made during the month. These tests were interrupted upon eight occasions by slag tap pluggage or imminent pluggage A 15 to 20 day opuations text was begun during the month, but not successfully completed owing to the tap hole pluaggage problems Iron reduced from the slag due to the low oxygen concentration in this region was the most obvious explanation for the tap hole pluggages

N82-13252# Ultrasystems, Inc., Irvine, Calif FEASIBILITY STUDY REPORT FOR THE IMPERIAL VALLEY ETHANOL REFINERY: A 14.9-MILLION-GALLON-PER-YEAR ETHANOL SYNFUEL REFINERY UTILIZING GEOTHERMAL **ENERGY**

Mar 1981 202 p Prepared in cooperation with U.S. Alcohol Fuels, East Mesa, Calif

(Contract DE-FG07-80RA-50308, Proj. 1013)

(DF82-000288 DOE/RA-50308/1) NTIS

HC A10/MF A01

The construction and operation of a 14,980,000 gallon per year fuel ethanol from grain refinery is proposed. The refinery will use hot geothermal fluid from geothermal resources as the source of process energy In order to evaluate the economic viability of the proposed project, exhaustive engineering, cost analysis, and financial studies were undertaken. The results of feasibility studies undertaken in geothermal resource, engineering, marketing financing, management, environment, and permits and approvals are presented. The project was found to be economically DOE

N82-13473# Los Alamos Scientific Lab., N Mex Dept of Meteorology

SPECTRA OVER COMPLEX TERRAIN

H A Panofsky, D Larko (Research and Data Systems, Inc.), R Lipschutz (NOAA, Boulder, Colo), and G Stone 1981 18 p refs Presented at the 4th U.S. Natl. Conf. on Wind Eng. Res., Seattle, 26-29 Jul 1981 Submitted for publication (Contract W-7405-eng-36)

(DE81-028734, LA-UR-81-2380, CONF-810742-1) Avail

NTIS HC A02/MF A01

Spectra were measured over land downwind of a water surface over hilltops escarpments, and over rolling farmland. The following hypotheses are used to explain the differences between these spectra (1) wavelengths short compared to the fetch over the new terrain, spectral densities are in equilibrium with the new terrain. (2) wavelengths long compared to this fetch, spectral densities remain unchanged if the ground is horizontal If the flow is over a steep hill, the low frequency structure is modified by distortion of the mean flow, with the longitudinal component losing energy relative to the lateral and vertical components. It is found that vertical velocity spectra contain relatively less low frequency energy than horizontal velocity spectra, energetic vertical velocity fluctuations tend to be in equilibrium with local terrain

N82-13475# Minnesota Univ., Minneapolis Limnological Research Center

DEVELOPMENT OF PEATLANDS IN NORTHERN MINNE-SOTA Technical Progress Report

H E Wright, Jr Sep 1981 5 p refs (Contract DE-AC02-80EV-10414)

considered as an energy resource through the development of a gasification operation were studied Problems of peat mining. draining, reclamation, economic impact, wildlife, and vegetation

(DE82-000873: DOE/EV-10414/T1) Avail NTIS HC A02/MF A01 The extensive peatlands in northern Minnesota, which are are discussed. The history of formation of the major peatlands in northern Minnesota, and their relationship distribution and composition, to the modern and past climate and to the various natural factors and processes prevailing in the region are investigated. The following factors are considered, the formation of vegetation patterns that seem to be unique for North American peatlands, regional differences from east to west that may reflect trends in postglacial climate and forest composition, rates of peat formation in different environmental settings, and the record of atmospheric pollution (industrial contaminations, agricultural dust) that may be contained in short cores of peat

Dept of Chemical and N82-13486# Pittsburg Univ. Pa Petroleum Engineering.

WATER AND ENERGY USAGE IN COAL PREPARATION Final Report

S H Chiang and Robert E Douglas May 1981 575 p refs Sponsored by the Geological Survey (PB81-238248) Avail NTIS HC A24/MF A01 CSCL 081

The demand for water and energy by those industries physically beneficiating Eastern American coals was analyzed and predicted Both the method and equipment utilized in cleaning coarse and fine coals were evaluated for their respective water and energy requirements. Five typical coal cleaning facilities employing various cleaning, comminution, screening, dewatering and drying equipment were simulated with a computer. Seven characteristic eastern coals (with ash and sulfur concentrations of 19-36 percent and 05-85 percent, respectively) were systematically evaluated in the conceptual coal preparation plants

N82-13488# Bureau of Mines, Pittsburgh, Pa CREATING A SAFER ENVIRONMENT IN US COAL MINES: THE BUREAU OF MINES METHANE, CONTROL PROGRAM, 1964-79

Milford L Skow, A G Kim, and M Deul May 1981 57 p

(PB81-233918 BM-SP-5-81) Avail NTIS HC A04/MF A01 CSCL 08I

The principal activities and results of 15 years of research on methane control in coal mines are summarized. Fundamental factors regarding the occurrence and movement of methane in coalbeds, removal of methane prior to mining, and control of methane during mining were investigated. Publications on methane control program, a section on methane recovery and use, a look at the upcoming Bureau of Mines research program, and a brief review of methane drainage practices in other coal producing countries are included GRA

N82-13518# Oregon State Univ , Corvallis Dept. of Atmospheric

NETWORK WIND POWER OVER THE PACIFIC NORTH-WEST. APPENDIX 1: WIND STATISTICS SUMMARIES FOR THE WIND POWER DATA STATIONS Progress Report,

Oct. 1979 - Sep. 1980 R. W. Baker and E. W. Hewson Oct. 1980 122 p. refs (DE81-029291; DOE/BP-60) Avail: NTIS HC A06/MF A01

Tables and graphs are presented concerning monthly wind speed summaries, wind spectrum analyzer summaries; high wind speed summaries; and six hourly speed and direction plots for selected wind power sites. Wind flow plots in the Goodnoe Hills MOD-2 wind turbine area and wind flow plots in the Goodnoe Hills and Juniper Point area are included

N82-13520# Sandia Labs , Albuquerque, N Mex GEOTHERMAL-RESOURCE VERIFICATION FOR AIR FORCE BASES

NTIS

P. R. Grant, Jr Jun 1981 56 p refs (Contract DE-AC04-76DP-00789) (DE81-027482. SAND-81-7123) Avail HC A04/MF A01

The various tupe of geothermal energy and legal uncertainties of the resource are summarized A methodology to evaluate geothermal resources for applications to US. Air Force bases is described Estimates suggest that exploration costs will be \$50,000 to \$300,000 which, if favorable, would lead to drilling a \$500,000 exploration well. Successful identification and development of a geothermal resource could provide all base, fixed system needs with an inexpensive, renewable energy source.

N82-13538# Oak Ridge Associated Universities, Tenn Labor and Policy Studies Program

BIOMASS ENERGY SYSTEMS: DESCRIPTIONS AND EMPLOYMENT REQUIREMENTS FOR TYPICAL OPERA-TIONS

S E Bell and Joanna R Little Sep 1981 90 p (Contract DE-AC05-760R-00033)

(DE82-000236, ORAU-185) Avail NTIS HC A05/MF A01
Operations related to biomass energy feasibility studies, and expert opinion which as the basis for the typical facility description and employment estimates are reported Biomass energy facilities are small by comparison to other energy sector operations, they have a sizable impacts on the communities and regions in which they are located. The employment and earnings generated during construction, operation, and maintenance provide an important stimulus to local economies. The facility descriptions estimated employment and earnings implications provide a first approximation of what is expected as the use of biomass energy systems increases.

N82-13541# Dynatech Corp., Cambridge, Mass BIOMETHANATION OF BIOMASS PYROLYSIS GASES Final Report

C A Tracy and E Ashare Aug 1981 130 p (Contracts DE-AC02-77CH-00178, EG-77-C-01-4042) (DE82-000238, SERI/TR-98356-1) Avail NTIS HC A07/MF A01

The development of the biological methanation process and conditions for maximum performane were studied Gasification processes have the potential to produce a synthesis gas from biomass. The advantage of such processes is that all organic components of the biomass may be converted to synthesis gas. However, this low Btu value gas is of limited use as a fuel gas. To convert the synthesis gas into pipeline qulity methane, a methanation process is necessary. A more economical alternative to catalytic methanation at high temperature and pressure is the utilization of a biological system to carry out the conversion of biomass pyrolysis gases to methana.

N82-13545# Pau Univ (France)

MICROEMULSIONS, EMULSIONS AND RELATED SYSTEMS: ENERGY APPLICATIONS [MICROEMULSIONS, EMULSIONS ET SYSTEMES CONNEXES: APPLICATIONS ENERGETIQUES]

1980 29 p refs in FRENCH Presented at Journee d'Etudes on Emulsions, Microemulsions et Systemes Connexes, Agents de Recuperation, de Stockage et de Transformation d'Energie, Pau, France, 25 Jan 1980
Avail NTIS HC A03/MF A01

Summaries of 16 lectures are presented Topics include oil recovery, thermodynamics of surface-active agents and microemulsions, interpretation of properties particular to alcohols in water-alcohol-oil ternary systems, phase diagrams and interfacial properties of the system water-dodecane-pentanol-sodium octlybenzene sulfonate, and modeling structural inversion in microemulsions. Other subjects are numerical study of diphasic one and two dimensional flow in a porous medium, storage and transport of low temperature thermal energy as latent heat in dispersed systems, and the dynamics of nonNewtonian solutions.

N82-13578 West Virginia Univ, Morgantown PYROLYTIC CHARACTERIZATION OF THE ORGANIC MATTER IN SELECTED COALS AND IN THE DEVONIAN SHALES OF SOUTHERN WEST VIRGINIA Ph.D. Thesis Peter Alexander Kelley 1980 275 p Avail Univ Microfilms Order No 8123953

Selected whole coal samples from the coal sequence in West Virginia and shale samples of the Devonian black shales collected throughout southern West Virginia were subjected to pyrolytic analysis Pyrograms characteristically showed two main groups of peaks, the first group of peaks representing the volume of hydrocarbons already present in the samples which are volatilized during the heating interval 40 C to 405 C, while the second group of peaks represents the hydrocarbons and related compounds generated during the 405 C to 700 C interval Allicoal pyrograms gave a maximum in the pyrolysis curve which occurred in 400 C to 600 C temperature range. The degree of maturation of the organics in the Devonian shale samples was evaluated using the temperature of the maximum hydrocarbon generation during pyrolysis from 405 C to 700 C and the

04 FUELS AND OTHER SOURCES OF ENERGY

transformation ratio. The peak area units and relative values were used to evaluate the organic richness genetic potential, and hydrocarbon proportions in the Devonian shale samples.

Dissert Abstr

N82-13619 Northwestern Univ. Evanston, III
APPLICATION OF BAYESIAN ANALYSIS FOR WIND
ENERGY SITE EVALUATION Ph.D. Thesis

Harish Govinda Rao 1981 142 p Avail Univ Microfilms Order No 8124987

Extensive research had indicated that the wind speed is well modelled by the single-parameter Rayleigh distribution. The site mean wind speed is given a prior distribution obtained from historical National Weather Service data of sites in the region. The prior distribution is updated to a posterior each time observed data become available. The posterior distribution is combined with the Rayleigh distribution to obtain the Bayesian distribution of wind speed. This distribution can be used in conjunction with the turbine power characteristics of different machines to make rational decisions, based on the expected maximum utility criterion, for selecting the best turbine for a given site or the best site for a given turbine.

N82-13627# Pacific Northwest Lab . Richland, Wash NUMERICAL WIND-SPEED SIMULATION MODEL

J V Ramsdell, G F Athey, and M Y Ballinger Sep 1981 88 p refs

(Contract DE-AC06-76RL-01830)

(DE82-000956, PNL-3864) Avail NTIS HC A05/MF A01

A stochastic model for simulating wind speed time series that can be used as an alternative to time series from representative locations is described. The model incorporates systematic seasonal variation of the mean wind, its standard deviation, and the correlation speeds. It also incorporates systematic diurnal variation of the mean speed and standard deviation Model capabilities, are simulated and results of analysis of simulated and actual data are compared.

N82-14317# Delaware Univ. Newark Center for Catalytic Science and Technology

DEVELOPMENT OF SUPERIOR DENITROGENATION AND ISOMERIZATION CATALYSTS FOR PROCESSING CRUDE OIL DERIVED FROM SHALE, PART 1 Final Interim Report James R Katzer, Alvin B Stiles, and Harold Kwart 15 Aug 1981 23 p refs

(Contract N00019-80-K-0507)

(AD-A105667) Avail NTIS HC A02/MF A01 CSCL 08/7 For purposes of immediate application to shale oil, the most important conclusions derived from this preliminary work are the following (1) As with quinoline, total nitrogen removal in multiring condensed heterocycled amines involves hydrogenation of the aromatic rings followed by (an often slower) process of C-N bond scission (2) With multiring substrates of this nature the ring hydrogenation occurs more rapidly than the C-N bond scission reactions leading to the accumulation of considerable concentrations of hydrogenated nitrogen-containing species in the reaction mixture (3) The overall rates of N-removal do not vary significantly because the rates of C-N bond scission in these hydrogenated species are quite similar (4) The rates of these reactions would appear to be somewhat affected by steric hindrance to adsorption caused by the puckered cyclohexane rings and the similarity of rates must be due to the similarity of the steric effects

N82-14323# Sandia Labs, Albuquerque, N Mex CATALYTIC EFFECT OF IRON IN HYDROGASIFICATION OF COAL

T D Padrick, D D Dees, and T M Massis 1981 9 p refs Presented at the 11th North Am Thermal Analysis Soc Conf. New Orleans, 19 Oct 1981

(Contract DE-AC04-76DP-00789)

(DE81-023928, SAND-81-0715C, CONF-811014-2) Avail NTIS HC A02/MF A01

Results indicate that finely divided hematite enhances the production of methane, by a factor of fifteen, during char gasification at one atmosphere of hydrogen Gasification rates were measured by heating the samples in a thermal gravimetric analysis system to a fixed temperature and then monitoring the rate of weight loss versus time. Product gas analysis indicates that during char gasification with hematite present, greater than 85 mole % of the gas is methane. The catalytic form of the

hematite was identified as reduced iron. The effect of the reduced iron as a catalyst is strongly dependent on particle size. The catalytic activity is also dependent on precursor species with the following order observed Fe2O3, Fe3O4, FeS2, Fe

United Technologies Research Center, East NB2-14371*# Hartford, Conn.

EXTERNAL FUEL VAPORIZATION STUDY Final Report
E. J Szetela and J A TeVelde Nov 1981 92 p refs
(NASA-CR-165513, UTRC-81-915326-15) HC A05/MF A01 CSCL 21D

The feasibility of external fuel vaporization in advanced aircraft gas turbine engines is addressed. Experiments were run to determine key fuel properties including boiling points, dew points, critical temperature, critical pressure, heat transfer coefficients, deposit formation rates, and deposit removal in a flowing system Of particular concern were the heat transfer rate in the heat exchanger and the performance of the orifice used in the throttling process. Three fuels were utilized in the experiments including Jet-A, Experimental referee broad specification fuel, and a premium No 2 diesel fuel Engine conditions representing the NASA Energy Efficient Engine at sea level takeoff, cruise, and idle were simulated in the vaporization system and it was found that single phase flow was maintained in the heat exchanger and downstream of the throttle Deposits encountered in the heat exchanger represented a thermal resistance as high as 0013 sq M K/watt and a deposit formation rate as high as 800 micro-gC/sq cm hr These values are equivalent to a buildup of 0 055 cm of thickness in 36 hours resulting in a more severe fouling condition than originally anticipated It was found that the deposit can be removed by cleaning with air at a temperature of 720 K for 10 minutes

N82-14374# Department of Energy, Laramie, Wyo **Technology Center**

SIXTH UNDERGROUND 'COAL-CONVERSION SYMPO-SIUM

1980 619 p refs Symp held in Shangri-la, Okla., 13-17 Jul 1980 Prepared in cooperation with Williams Bros Engineering

Co, Tulsa, Okla (DE81-027669. CONF-800716) Avail

HC A99/MF A01

Department of Energy underground coal gasification (UCG) field programs at different sites are reviewed Private sector industrial activity in UCG is reported. Mathematical modeling for UCG processes is discussed Laboratory studies concerning UCG are presented Environmental studies concerning specific UCG sites are examined The economics of UCG are addressed Instruments and controls are considered. General topics relevant to UCG are included

N82-14375# Lincoln Land Community Coll , Springfield, III ALCOHOL FUELS GRANT PROGRAM AT LINCOLN LAND COMMUNITY COLLEGE, SPRINGFIELD, ILLINOIS Report

1981 14 p

(Contract DE-FG02-80IR-1855)

(DE82-000744. DOE/IR-10855/T1) NTIS

HC A02/MF A01

Progress in the development of alcohol fuels is reported A tristar still was produced during demonstrations and workshops Two cars were converted to run on the fuel produced from the still Preliminary trials of a converted tractor using ethanol and water are reported. Information on the curriculum developed as part of this program is presented

N82-14377# Andco Environmental Processes, Inc., Buffalo, N Y FEASIBILITY STUDY FOR AN ALCOHOL-FUELS PLANT FOR **BUFFALO, NEW YORK**

Nov 1980 369 p refs

(Contract DE-FG01-80RA-50357)

(DE82-000032: DOE/RA-50357/T1) HC A16/MF A01

NTIS Avail

A feasibility study was conducted of a 15,000,000 gal per year anhydrous ethanol plant to be located in the Buffalo area All major aspects of the construction and operation of the plant were investigated it is concluded that (1) the volatile energy situation presents too much of a risk for bankers and investors unless the Department of Energy quarantees that they will purchase any alcohol not sold on the open market at a quaranteed price formula. (2) the complete plant design was prepared and

it appears that there is very little technological risk in the process. (3) a suitable plant site is available with all necessary utilities and the plant equipment has been laid out for this site. (4) the plant easily complies with environmental, health, safety and socioeconomic requirements, (5) raw materials consisting of corn and coal are readily available in adequate quantity and at reasonable prices in the Buffalo area, (6) the distillers dried grains and the carbon dioxide can both be sold in their entirety at reasonable prices, and (7) capital cost and operating cost are such that the alcohol plant makes an attractive investment with reasonable payout and profit potential DOF

N82-14379# Brookhaven National Lab. Upton, N Y Dept of Energy and Environment

COAL-OIL MIXTURES: AN ALTERNATIVE FUEL FOR THE COMMERCIAL MARKETS AND LARGE RESIDENTIAL MARKETS

Thomas A Butcher and Robert J Isler 1981 29 p Presented at the Intern Conf on Residential Solid Fuels, Portland, Oreg. 1 Jun 1981

(Contract DE-AC02-76CH-00016)

(DE81-028335, BNL-29773, CONF-810674-2) Avail NTIS HC A03/MF A01

Results are presented of a program aimed at promoting wide-spread use of coal-oil mixtures in large residential and commercial sector size oil-fired heating equipment. Fuel properties are discussed including viscosity, heating values, and effect of coal particle size. On-site mixing of COM is not considered practical for users in this size range and a number of central preparation plant projects are in progress. Options for on-site storage including the addition of paddle agitators, recirculation agitation systems, auxiliary tanks, and stable slurries are discussed Fuel pump, controls, and atomizer modifications will be required as well Special problems of sootblowers, cyclones, baghouses, and scrubbers are considered

N82-14380# Kerr-McGee Corp , Oklahoma City PROCESS DEVELOPMENT FOR IMPROVED SRC OPTIONS. KERR-MCGEE CRITICAL SOLVENT DEASHING AND FRACTIONATION STUDIES Final Report
R A Baldwin, R E Davis, L D Gillham, R C Janka, R E

Leonard, and D E Rhodes Jul 1981 108 p refs Sponsored by EPRI

(EPRI Proj 1134-2) (DE81-903785. EPRI-AP-1932)

NTIS Avail

HC A06/MF A01

The solvent refined coal 1/2 process, a coal liquefaction process which includes Kerr-McGee critical solvent deashing (CSD), was demonstrated in a blocked-out fashion in continuous bench-scale units. It was demonstrated that conventional SRC-I as well as short-residence-time vacuum bottoms could be successfully deashed and fractionated and that the fractionated portion of the soluble coal product, light SRC, could be added to the liquefaction solvent to improve its quality. An amount of light SRC equivalent to that which was initially added to the liquefaction solvent was recovered in the CSD process in most cases to maintain light SRC recycle. It was found that soluble coal product recovery was inversely proportional to the first-stage CSD temperature and that the fractionation step was sensitive to deashing solvent to feed ratio The SRC-1/2 process was not, however, fully integrated and therefore these results are not necessarily indicative of steady-state conditions DOE

N82-14381# Brookhaven National Lab , Upton, N Y Dept of Energy and Environment

POTENTIAL SUPPLY OF SYNTHETIC FUELS FROM ALASKAN HYDROELECTRIC POWER AND COAL

Meyer Steinberg and James R Powell 1981 15 p refs Presented at the IGRC 1981 Conf. Chicago, 28 Sep~1981

(Contract DE-AC02-76CH-00016)

(DE81-025743, BNL-29764, CONF-810933-1) Avail NTIS HC A02/MF A01

It is proposed to develop and utilize the large potential hydroelectric power resources in Alaska to produce hydrogen by the electrolytic decomposition of water and to combine the hydrogen with the large Alaskan coal reserves to produce synthetic liquid and gaseous fuels. It is estimated that in this manner, as much as 18 million bbls/day of gasoline or 62 billion SCF/day of substitute natural gas can be produced. The existing and projected Alaskan pipelines would provide the means of transporting the fuels to energy consuming load centers in the U.S. This development would move the US a considerable way towards energy independence as well as employing the material resources in Alaska in an efficient manner

N82-14383# Battelle Pacific Northwest Labs , Richland, Wash BIOMASS ENERGY UTILIZATION IN THE PACIFIC NORTHWEST. IMPACTS ASSOCIATED WITH RESIDEN-TIAL USE OF SOLID FUELS

Petty, W Hopp, and A Chockie May 1981 23 p refs Presented at the 1981 Intern Conf on Residential Solid Fuels.
Portland, Oreg. 1 Jun 1981
(Contract DE-AC06-76RL-01830)

woodcutters

(DE81-029137, PNL-SA-9618, CONF-810674-3) Avail NTIS HC A02/MF A01

The Pacific Northwest Region, including Washington, Oregon. and Idaho, is the geographic area for which an impact assessment of the residential use of solid fuels is performed. An estimate of the potential energy contained in the fuelwood burned annually and an estimate of the mean conversion efficiency of the regional capital stock of woodburning appliances leads to a reasoned assessment of the contribution of wood energy to the residenital energy use in the region. The use of solid fuels was associated with an increase in the incidence of residential fires nationally An estimate is made of the economic costs attributable to this source of fire incidence An additional area of concern relates to the harvesting practices of hundreds of individuals, cutting fuelwood for their own use Statistics describing injuries and death per Btu in the commercial logging industry are used as a basis for an estimate of injuries and deaths resulting from the increased collection of forest residues and fuelwood by private

N82-14385# Punjab Agriculture Univ , Ludhiana (India) Coll of Agricultural Engineering

DOE

ENERGY BALANCE AND UTILIZATION OF AGRICULTURAL WASTE ON A FARM Final Report

B S Pathak, A P Bhatnagar, Dalijit Singh, and K S Salariya 1980 90 p refs Sponsored in part by Tata Energy Research Inst

(PB81-229262) Avail NTIS HC A05/MF A01 CSCL 21D The possibility of using crop residues and other agricultural works as a renewable energy source is investigated. Some conclusions drawn are energy requirements of tractor operated farms are only marginally higher than bullock operated farms. the use of commercial fuels for cooking in rural areas is very limited, most crop residues except paddy straw is used for fodder or fuel, farmers use dung as fuels although they know its use as a fertilizer, all energy required by farms could be self-generated, and paddy straw should be burned to produce electricity

N82-14386# Punjab Agriculture Univ , Ludhiana (India) Coll of Agricultural Engineering

STUDIES ON SUGARCANE AS AN ENERGY CROP FOR **PUNJAB Final Report**

B S Pathak, A P Bhatnagar, Dalijit Singh, and K S Salariya 1980 25 p refs Sponsored in part by Tata Energy Research

(PB81-232308) Avail NTIS HC A02/MF A01 CSCL 21D The energy costs and returns in the production of sugar cane and its conversion to alcohol, based on data collected from a sugar mill and a brewery, are presented Author (GRA)

N82-14522# Petro-Lewis Corp., Denver, Colo FIELD DEMONSTRATION OF THE CONVENTIONAL STEAM DRIVE PROCESS WITH ANCILLARY MATERIALS Quarterly Report, Jul. - Sep. 1980

David R Alden and Rod L Eson (Chemical Oil Recovery Co., Bakersfield, Calif) 7 Oct 1980 13 p

(Contract DE-FC03-79SF-10762)

(DE81-026849. DOE/SF-10762/T2) NTIS

HC A02/MF A01

This field test demonstrates an improved oil recovery process through the use of ancillary materials to steam drive injectors The ancillary materials are used to reduce injection in steam channels and thus force the injected steam to enter alternate flow paths Evaluation of the injection well production curves shows that currently there is over 125 incremental barrels of oil per day being produced by the four patterns receiving ancillary materials and that the incremental oil rate has been steadily increasing since the initial treatment in January, 1980 Preliminary work began on the evaluation of the producing temperatures.

04 FUELS AND OTHER SOURCES OF ENERGY

steam injection profiles, chemical tracer surveys, casing vent gas emissions and residual oil saturations in the six observation wells drilled

N82-14523# Chemical Oil Recovery Co., Bakersfield, Calif. FIELD DEMONSTRATION OF THE CONVENTIONAL STEAM DRIVE PROCESS WITH ANCILLARY MATERIALS Quarterly Report, Oct. - Dec. 1980

Rod L Eson and A M Shannon (Petro-Lewis Corp., Denver) Jan 1981 28 p

(Contract DE-FC03-79SF-10762)

(DE81-026962, DOE/SF-10762/T1) NTIS HC A03/MF A01

This field test demonstrates an improved oil recovery process through the use of ancillary materials to steam drive injectors The ancillary materials are used to reduce injection in steam channels and thus force the injected steam to enter alternate flow paths. During the first two months of this quarter up to 190 incremental barrels of oil per day were produced by the four patterns receiving ancillary materials. The evaluation of the producing temperatures, steam injection profiles, chemical tracer

N82-14561# Jet Propulsion Lab., California Inst. of Tech., Pasadena

surveys, casing vent gas emissions and residual oil saturations

THE SEASAT COMMERCIAL DEMONSTRATION PRO-GRAM

S W McCandless (User Systems Engineering, Annandale, Va.), B P Miller (Econ, Inc., Princeton, N.J.), and D. R Montgomery In ESA Appl of Remote Sensing Data on the Continental Shelf Jul 1981 p 59-72 refs (For primary document see N82-14553 05-43)

Avail NTIS HC A13/MF A01, ESA, Paris FF 125

in the six observation wells drilled is addressed

The background and development of the Seasat commercial demonstration program are reviewed and the Seasat spacecraft and its sensors (altimeter, wind field scatterometer, synthetic aperture radar, and scanning multichannel microwave radiometer) are described. The satellite data distribution system allows for selected sets of data, reformatted or tailored to specific needs and geographical regions, to be available to commercial users Products include sea level and upper atmospheric pressure, sea surface temperature, marine winds, significant wave heights, primary wave direction and period, and spectral wave data. The results of a set of retrospective case studies performed for the commercial demonstration program are described. These are in areas of application such as marine weather and ocean condition forecasting, offshore resource exploration and development, commercial fishing, and marine transportation Author (ESA)

Dept of Chemistry N82-14583# Bergen Univ (Norway) OIL SPILL IDENTIFICATION BY CHEMICAL ANALYSIS

O Grahl-Nielsen and S Wilhelmsen (Inst of Marine Research. Bergen) In ESA Appl of Remote Sensing Data on the Continental Shelf Jul 1981 p 243-244 refs (For primary document see N82-14553 05-43)

Avail NTIS HC A13/MF A01, ESA, Paris FF 125

Gas chromatographic analyses of the relative amounts of phenanthrene and dibenzothiophene and their alkylated derivatives are shown to distinguish crude oils from different parts of the world and crude oils from different fields in the North Sea Ekofisk area These aromatic hydrocarbons are relatively unaffected by weathering and can be used for matching oils from oil spills with unweathered samples from the suspected source. The method was used to identify the source of an oil spill in Bergen harbor It is shown that analysis of the relative amounts of dibenzothiophenes is sufficient to discriminate between crude oils in most cases Author (ESA)

N82-14594# Department of Energy, Laramie, Wyo BIBLIOGRAPHY OF PUBLICATIONS DEALING WITH TAR SANDS

Sep 1981 296 p

(DE81-026146. DOE/LETC/RI-81/2) NTIS HC A13/MF A01

A compilation of technical reports, patents, journal articles and books on the development of tar sands (oil sands). The emphasis is on the US resource and its development. Included are articles on nondomestic tar sand and related heavy oil resources and their development. The subjects include geology and resource evaluation, chemical and physical properties, in

situ recovery, upgrading and refining, history environmental, and miscellaneous (includes general survey papers, resource development, health and safety, economics, etc.) DOE

N82-14595# Tetra Tech, Inc., Columbus, Ohio EVALUATION OF DEVONIAN SHALE POTENTIAL IN EASTERN KENTUCKY/TENNESSEE

1981 104 p refs (Contract DE-AC21-79MC-10389)

(DE82-001164, DOE/METC-121) NTIS

HC A06/MF A01 The US Department of Energy's Eastern Gas Shales Project is designed not only to identify the resource, but also to test improved methods of inducing permeability to facilitate gas drainage, collection, and production. Results as they pertain to the Devonian gas shales of the Appalachian basin in eastern Kentucky and Tennessee are presented Geologic data and interpretations are summarized, and areas where the accumulation of gas may be large enough to justify commercial production are outlined DOE

N82-14612# Department of Energy, Pittsburgh, Pa Mining Technology Center

LONGWALL MINING OF THIN SEAMS

Ernest A Curth 1981 22 p refs Presented at the 1st Ann Conf on Ground Control in Mining, Morgantown, W. Va., 27 Jul 1981

(DE81-028042, CONF-810714-2) NTIS HC A02/MF A01

Thin seam operations pose a challenge to the ingenuity of mining engineers to overcome the factor of human inconvenience in the restricted environment and associated high cost production Suprisingly, low seam longwalls in the Federal Republic of Germany in an average thickness of 35 in and dipping less than 18 deg come close to achieving the average production rate of all German longwall operations. They are all plow faces, and a consistent production of 3300 tons per day and a productivity of 40 tons per man shift are reported from one of the thin seam longwalls. These results were attained by reliable high capacity equipment and roof support by shields that can be collapsed to as low as 22 inches Maximum mining height for plow operated faces lies at 31.5 inches. Technology development for the future is discussed

N82-14613# California Univ , Livermore Lawrence Livermore Lab

MATHEMATICAL MODELLING OF SOME CHEMICAL AND PHYSICAL PROCESSES IN UNDERGROUND COAL GASIFICATION

John R Creighton Aug 1981 5 p Presented at the Eastern The Combustion Inst Conf., Pittsburgh, 27-29 Oct 1981 Submitted for publication

(DE81-027941, UCRL-86518, CONF-811027-1) Avail NTIS HC A02/MF A01

The chemical and physical processes governing underground coal gasification were conducted on laboratory scale experiments accompanied by mathematical modelling Blocks of selected coal types are cut to fit 55 gallon oil drums and sealed in place with plaster A 1 cm diameter hole is drilled the length of the block and plumbing attached to provide a flow of air or oxygen/steam mixture. After an instrumented burn the block is sawed open to examine the cavity. Mathematical modelling is directed towards predicting the cavity shape. Sub models and their impact on predicted cavity shapes are examined DOE

N82-14614# Sandia Labs , Albuquerque, N Mex Geothermal Technology Development Div

ACCESSING THE GEOTHERMAL RESOURCES

James R Kelsey 1981 6 p refs Presented at the Showcase for Technol Conf , Albuquerque, N Mex , 28 Oct 1981 (Contract DE-AC04-76DP-00789)

(DE81-025396, SAND-81-1384C, CONF-811018-1) Avail NTIS HC A02/MF A01

The technology development efforts in the areas of drilling, completion, and logging instrumentation are described. These development efforts are aimed at solving the problems associated with the high temperatures, hard-fractured geological formations, and corrosive formation fluids

N82-14639# Pape, Evans, and Robbins, Inc., New York EVALUATION OF COAL GASIFICATION/COMBINED CYCLE

POWER PLANT FEASIBILITY AT THE SEWELLS POINT NAVAL COMPLEX, NORFOLK, VIRGINIA Final Report

Jul 1981 235 p refs

(Contract N62470-80-C-3736)

(AD-A103674) Avail NTIS HC A11/MF A01 CSCL 10/2 The feasibility of installing a coal gasification/combined cycle cogeneration plant at Sewells Point Naval Complex, Norfolk, Virginia is evaluated. Current gasification technology, combined cycle thermodynamics, environmental control requirements, and conventional coal fired cogeneration cycles are addressed. The utility interface, site considerations, and economic analyses are also presented it is concluded that a coal gasification/combined cycle cogeneration plant supplying 50 MW of electric power and 290,000 lb/hr of steam is technically feasible

N82-14680# Oak Ridge National Lab , Tenn COAL CONVERSION SOLID WASTE DISPOSAL

C W Francis, W J Boegly, Jr., R R Turner, and E C Davis 1981 21 p refs Presented at the Am Soc of Civil Engr Ann Meeting, Vail, Colo , 3 Aug 1981 (Contract W-7405-eng-26)

(DE81-028567, CONF-81085-1)

NTIS Avail

HC A02/MF A01

The major solid waste produced at coal conversion facilities will be gasification slag or ash. To evaluate the impact of this waste on the environment, extensive characterization and leaching studies were conducted on ash/slags that were generated in bench-scale operations, pilot plants, and/or process development units for the Cogas, British Gas/Lurgi, Grace/Texaco, U-Gas, Foster Wheeler/Stoic, SRC-I/Koppers-Totzek, SRC-II/Texaco, and Combustion Engineering gasification processes These studies, designed to assess the consequences of disposal in landfills, showed that none of the leachates from these eight wastes exceeded the US Environmental Protection Agency's toxicity limits established as a result of the Resource Conservation and Recovery Act of 1976 The major environmental impact associated with disposal of these solid wastes appears to be the dissolution of sulfate and the potential acidification of ground water

N82-14711 lowa Univ. Oakdale STRATIGRAPHY AND DEPOSITIONAL HISTORY OF THE IOLA LIMESTONE UPPER PENNSYLVANIAN (MIS-SOURIANI. NORTHERN MIDCONTINENT

Ph.D. Thesis John Charles Mitchell 1981 379 p

Avail Univ Microfilms Order No 8123341

The lola Limestone, one of the best developed and most laterally extensive, yet least studied Missourian cyclic carbonates in the Midcontinent Upper Pennsyvlanian, was studied. Along with adjacent shales, five members constitute the Iola cyclothem, a typical Kansas cyclothem in ascending order these are Chanute Shale, Paola Limestone, Munice Creek Shale, Raytown Limestone, and Lane/Bonner Springs Shale Although traditional interpretation of cyclothems regarded all shale as nearshore, shallow-water deposits, lola lithology and stratigraphy support the more recent hypothesis that the cyclothem represents a single transgressiveregressive event, with maximum transgression occurring during deposition of the Muncie Creek Shale Distribution of conodonts reflects the depositional pattern of the lola cyclothem Vertical variation far outweighs lateral variation in abundance and Dissert Abstr

N82-15152# Oak Ridge National Lab , Tenn THERMOLYSIS OF NAPHTHOLS

M L Poutsma and C W Dyer 1981 6 p refs Presented at the Intern Conf on Coal Sci., Dusseldorf, 7 Sep. 1981 (Contract W-7405-eng-26)

(DE81-029684. CONF-810914-6)

NTIS

HC A02/MF A01

A significant portion of the oxygen content of native coals and of the coal-derived liquids used as process solvents during hydroliquefaction of coal is present as phenolic hydroxyl groups Various reported phenomenological effects of the phenolic content of process solvents on liquefaction performance were reviewed Background data concerning the chemical behavior of phenols under conditions representative of liquefaction were found lacking The thermolysis of representative phenols under carefully defined conditions was studied. The behavior of the isomeric naphthols at 400 C in the absence of any purposely added reagents or catalysts is described. The results reveal a set of previously unrecognized thermal reactions by which phenols may be condensed to furans, be deoxygenated to arenes, and serve as

hydrogen donors. These processes, the latter two generally desirable and the former one undesirable, are inherently related MDK

N82-15165# National Bureau of Standards, Washington, D.C. High Temperature Processes Group

VAPORIZATION AND CHEMICAL TRANSPORT UNDER **COAL GASIFICATION CONDITIONS**

J W Hastie, D W Bonnell, E R Plante, and W S Horton Dec 1980 114 p refs

(Contract DOE-EA-77-A-01-6010)

NBSIR-80-2178-DOE) (PB81-245839. NTIS Avail

HC A06/MF A01 CSCL 07D

Transpiration mass spectrometry for the quantitative analysis of high vapor temperature gases and vapors is described. This technique was applied to vapor transport and thermodynamic activity determinations for real and synthetic coal slag samples in reactive coal gas components at atmospheric pressure. A highly nonideal and nonmonotonic (with temperature and composition variables) behavior for alkali metal vapor transport was indicated. Thus a priori predictions of alkali metal transport in coal gasifiers without actual activity data are virtually impossible at the present time Surface segregation and diffusion limitations of alkali species in slags are also possible complicating effects Author

N82-15221# Oak Ridge National Lab , Tenn Engineering Technology Div

FAILURE MODES AND EFFECTS ANALYSIS OF A COAL-

SLURRY PREHEATER H A Mitchell, L. F Parsly, and A N Smith Sep 1981 33 p refs

(Contract W-7405-eng-26)

ORNL/TM-7664) (DE81-030425.

NTIS Avail

HC A03/MF A01

Some 55 potential failure modes were identified in a coal slurry preheater, a critical component in a typical coal direct liquefaction plant. Fourteen of these events, if they should occur, would result in losses of sufficient magnitude to require special consideration in the design or operating phase to assure control of risk at an acceptable level it is concluded that the failure modes and effects analysis technique (FMEA) could be a valuable tool in the identification of critical components for coal conversion systems For maximum effect, FMEA needs to be used during the initial design phase. Its principal value is to determine high-risk failure modes, which could have unacceptable impacts on system safety and reliability/availability. The usefulness of FMEA can be improved if it is supplemented by the development of a failure data base, this data base could also be of value in selected cases as input to a more detailed technique such as a fault-free analysis DOE

N82-15222# Oak Ridge National Lab. Tenn Engineering Technology Div

COAL AND LIMESTONE FEED TESTING FOR ATMO-SPHERIC FLUIDIZED BED COMBUSTION

C S Daw, J F Thomas, and M E Lackey Sep 1981 78 p (Contract W-7405-eng-36)

(DE81-030629. **ÖRNL/TM-7724**) Avail · HC A05/MF A01

Pneumatic conveying tests of coal and coal limestone mixtures were performed on a conveying system designed to represent the branch feed lines in the TVA 20 MW(e) atmospheric fluidized bed combustor pilot plant. Test conditions were chosen to cover the operating ranges anticipated for the pilot plant. These tests led to a basic understanding of the design and operating problems associated with coal surface moisture, air velocity, fines content, solids loading, and limestone to coal ratio. Coal surface moisture was found to be the most important parameter affecting handling properties. Above a critical level of about six %, surface moisture caused severe compaction problems in the feed hopper and impact plugging in the conveyor line. When surface moisture was less than six %, conveyor line plugging resulted only from saltation and filling

N82-15224# Department of Energy, Bartlesville, Okla MOTOR GASOLINES, WINTER 1980-81

E M Shelton Jul 1981 67 p refs (DE81-030845, DOE/BETC/PPS-81/3)

Avail: NTIS

HC A04/MF A01

A compilation of analytical data for 546 samples of motor gasoline produced by 23 manufacturers is presented. The data are tabulated by groups according to brands (unlabeled) and

04 FUELS AND OTHER SOURCES OF ENERGY

grades for 17 marketing districts into which the country is divided A map showing marketing areas, districts, and sampling locations is induced. Trends of selected properties of motor fuels since 1959 are charted Octane distribution percent charts for areas 1, 2, 3, and 4 for unleaded antiknock index (R + M)/2 below 90 0, unleaded antiknock index (R + M)/2 below 93 0, and leaded antiknock index (R + M)/2 93 0 and above grades of gasoline are presented. The antiknock (octane) index (R + M)/2 averages of gasoline sold in this country were 87 6 unleaded below 90 0, 91 4 unleaded 90 0 and above, 89.1 leaded below 93 0, and 93 3 leaded 93 0 and above grades of gasoline DOE

N82-15225# Texas Univ . Austin Bureau of Economic Geology

ASSESSMENT OF IN-PLACE SOLUTION METHANE IN TERTIARY SANDSTONES: TEXAS GULF COAST

A R Gregory, M M Dodge, J S Posey, and R A Morton 1981 8 p refs Presented at the 5th Geopressured-geothermal Energy Conf., Baton Rouge, La., 13 Oct. 1981

(Contract DE-AC08-78ET-11397)

(DE81-029772, CONF-811026-5)

NTIS Avail:

HC A02/MF A01

The total volume of in place methane dissolved in formation waters of deep sandstone reservoirs of the onshore Texas Gulf Coast within the stratigraphic section extending from the base of significant hydrocarbon production (8000 ft) to the deepest significant sandstone occurrence is appraised Reservoir bulk volume, porosity, and methane solubility were evaluated. The latter is controlled by the temperature, pressure, and salinity of formation waters Regional assessment of the volume and distribution of potential sandstone reservoirs was made from a data base of 880 electrical well logs, from which a grid of 24 structural dip cross sections and 4 strike cross sections was constructed These cross sections extend from near the Wilcox outcrop to the coastline. The structural and stratigraphic framework of Tertiary sandstone units was mapped. Structual and stratigraphic frame-boundaries were used to divide the Texas Gulf Coast into 24 subdivisions. Methane content in each of nine formations or divisions of formations was determined for each subdivision. The total in place methane for Tertiary sandstones below 8000 ft in the Texas Gulf Coast was found to be 690 TCF The total in place methane for effective Tertiary sandstones (sandstone units greater than 30 ft thick) below 8000 ft was **325 TCF**

N82-15226# Battelle Pacific Northwest Labs , Richland, Wash THERMOCHEMICAL PRODUCTION OF LIQUIDS FROM BIOMASS

D C Elliott 1981 8 p refs Presented at Solar World Forum, Brighton, England, 23 Aug 1981

(Contract DF-AC06-76RL-01830)

(DE81-030085, PNL-SA-9246, CONF-810865-1) Avail NTIS HC A02/MF A01

The chemistry of this process is essentially that of the CO-steam process wherein carbon monoxide and water, catalyzed by sodium carbonate, are the reducing agents for the biomass A water slurry process involving a prehydrolysis step for wood chips has been used to produce the first biomass-derived oil on a large scale A second variation which requires recycle of a portion of the product for use as the carrier vehicle for wood flour has also been developed to the point of producing multi-barrel quantities of product. An extensive amount of product analysis has been completed on both types of product. They are similar, being highly phenolic and approximately 10% by weight of oxygen. Utilization of the product as a boiler fuel has been tested and other uses of the product are now being investigated Analytical results and product application tests are discussed

N82-15227# California Univ. Livermore Lawrence Livermore

HIGH-PRESSURE SOLVENT EXTRACTION OF METHANE FROM GEOPRESSURED FLUIDS

R Quong, H H Otuski, F E Locke, and R Netherton Aug 1981 6 p refs Presented at the 5th Geopressured-Geothermal Energy Conf., Baton Rouge, La., 13-15 Oct. 1981 Submitted for publication

(Contract W-7405-eng-48)

(DE81-027713, UCRL-86515, CONF-811026-2) Avail NTIS HC A02/MF A01

Technical and economic aspects of solvent extraction as a

means of recovering dissolved methane from geopressuredgeothermal brines at high pressures are considered Economic assessment shows that additional investment in a high pressure solvent extraction plant preceding direct injection disposal of brines into isolated aquifers can be profitable. Solvent extraction is compared with other injection methods. The contributions of hydraulic (pressure) energy recovery and geothermal power production are also assessed. The solubilities of a promising solvent, n-hexadecane, and a potential low cost solvent. No 2 Diesel fuel, were measured in 15 wt percent NaCl solutions at temperatures up to 150 C Preliminary results of initial extraction tests at 150 C and 1000 psi in sub-pilot scale equipment are also presented DOF

N82-15232# Massachusetts Inst of Tech. Cambridge LNG Research Center

LIQUID NATURAL GAS RAPID PHASE TRANSITIONS Topical Report, Sep. 1979 - Sep. 1980

George A Corbin and Robert C Reid Jan 1981 99 p refs Prepared for Gas Research Inst

(PB81-244774. GRI-80/0031)

NTIS Avail.

NTIS

HC A05/MF A01 CSCL 21D

An apparatus was constructed to test the concept of initiating a rapid phase transition (RPT) in methane-rich LNG on water by collapsing the vapor film with a shock wave. Helium overpressures were achieved by breaking a diaphragm in a high-pressure helium chamber. Pressure transducers recorded subsequent events NORPT were noted for liquid nitrogen, liquid ethane, liquid methane or methane-rich LNG even with helium driver pressures up to 62 bar The helium did, however, greatly enhance the boiling rate of the cryogen on water. On the basis of analytical modelling, it was concluded that a RPT would be very improbable for a methane-rich LNG contacting ambient water in a mode where the surface pressures were high. In the course of the project, a new thermodynamic model was developed as a possible explanation for a RPT in cases where the hot tiquid temperature would exceed the critical temperature of the GRA cryogen

N82-15233# Southwest Research Inst , San Antonio, Tex CHARACTERIZATION OF DIESEL EMISSIONS AS A FUNCTION OF FUEL VARIABLES Final Report, Sep. 1979 - Mar. 1981

Bruce B Bykowski Mar 1981 288 p refs (Contract EPA-68-03-2707)

(PB81-244048, EPA/460-3-81-015)

HC A11/MF A01 CSCL 21D

emissions

Several properties of a refinery 'straight run kerosene', which have a narrow boiling range approximating the middle of a No 1 diesel fuel, were altered to study their effects on regulated and unregulated.exhaust emissions. Eleven fuel blends, representing changes in nitrogen content, aromatic level, boiling point distribution, olefin content, and cetane number, were evaluated Statistical analysis, including regression, was performed using selected fuel properties as independent variables. Higher aromatic levels are generally associated with increased emissions, while

N82-15452# Ricardo & Co., Engineers (1927) Ltd., Shoreham-by-Sea (England)

increased olefin levels are generally associated with decrease

THE UTILISATION OF ALCOHOL IN LIGHT DUTY DIESEL **ENGINES Final Report**

28 May 1981 41 p refs Sponsored by EPA (PB81-244469, EPA-460/3-81-010, DP-81/935) Avail NTIS HC A03/MF A01 CSCL 21G

Various approaches employed to facilitate the utilization of alcohols, methanol and ethanol, in light duty diesel engines were reviewed. The choice of which system to employ is most heavily influenced by the proportion of alcohol substitution which is required and the resulting engine first cost penalty which is deemed to be acceptable Alcohol utilization by more or less conventional spark ignited engines appears to be far less problematical than conversion of diesel engines

N82-15489*# Geological Survey, Denver, Colo.
GEOLOGIC APPLICATIONS OF THERMAL-INERTIA MAPPING FROM SATELLITE Final Report

Terry W Offield, Principal Investigator, Kenneth Watson, and Susanne Hummer-Miller Jul 1981 109 p refs Original contains imagery Original imagery may be purchased from NASA Goddard Space Flight Center, (Code 601), Greenbelt, Md 20771 Domestic users send orders to 'Attn National Space Science Data Center', non-domestic users send orders to 'Attn. Data Center A for Rockets and Satellites' HCMM (NASA Order S-40256-B)

Avail.

NTIS

NTIS

(E82-10011, NASA-CR-164818)

HC A06/MF A01 CSCL 08B

In the Powder River Basin, Wyo, narrow geologic units having thermal inertias which contrast with their surroundings can be discriminated in optimal images. A few subtle thermal inertia anomalies coincide with areas of helium leakage believed to be associated with deep oil and gas concentrations. The most important results involved delineation of tectonic framework elements some of which were not previously recognized Thermal and thermal inertia images also permit mapping of geomorphic textural domains. A thermal lineament appears to reveal a basement discontinuity which involves the Homestake Mine in the Black Hill, a zone of Tertiary igneous activity and facies control in oil producing horizons. Applications of these data to the Cabeza Prieta, Arız , area illustrate their potential for igneous rock type discrimination Extension to Yellowstone National Park resulted in the detection of additional structural information but surface hydrothermal features could not be distinguished with any confidence. A thermal inertia mapping algorithm, a fast and accurate image registration technique, and an efficient topographic slope and elevation correction method were developed

N82-15505# Texas Univ., Austin Bureau of Economic Geology

STRUCTURAL EVOLUTION OF THREE GEOPRESSURED-GEOTHERMAL AREAS IN THE TEXAS GULF COAST

Charles D Winker, Robert A Morton, and Deborah D Garcia 1981 13 p refs Presented at the 5th Geopressured-Geothermal Energy Conf. Baton Rouge, La., 13 Oct 1981 (Contract DE-ACO8-79ET-27111)

(DE81-029799. CONF-811026-9)

NTIS HC A02/MF A01

Detailed analysis of geological and seismic data from several geopressured geothermal areas (Cuero, Blessing, Pleasant Bayou) reveals similarities in structural-stratigraphic relationships that form geopressured aquifers as well as differences in structural complexity and evolution that characterize the different areas. In these examples, geopressured sandstones are isolated on the updip side by downfaulting against shelf-slope shales, and on the downdip side by unfaulting against transgressive marine shales Moreover, they are isolated above and below by thick sequences of transgressive shale or interbedded sandstone and shale Prospective reservoirs are found where delatic and associated sandstones (distributary channel, delta front, barrie-strandplain) were deposited seaward of major growth faults and near the shelf margin

N82-15508# Gulf Universities Research Consortium, Bellaire, Tex.

RELATIONAL METHODOLOGY FOR INTEGRATING AND ANALYZING FIELD TEST AND RESEARCH DATA DE-SCRIBING ENHANCED OIL RECOVERY

Bill A. Bavinger, Scott Callaway, Donna Tice Goodbread, and James L Gumnick Oct 1981 154 p refs (Contract DE-ACO1-76ET-10145)

(DE81-030441: DOE/ET-10145/72) Avail: HC A08/MF A01

The application of concepts of relational analysis for the integration of two experimental data bases was demonstrated The following data bases are created: the enhanced oil recovery field test data base; and the enhanced oil recovery research data base

N82-15509# University of Southern Mississippi, Hattiesburg Dept of Polymer Science

IMPROVED POLYMERS FOR ENHANCED OIL RECOVERY SYNTHESIS AND RHEOLOGY Annual Report, Oct. 1979 -

C. L. McCormick, R. D. Hester, H. H. Neidinger, and G. C. Wildman Apr. 1981 300 p refs

(Contracts DE-AS05-77ET-12038, EF-77-S-05-5603)

(DE81-030194; DOE/ET-12038/T3; AR-3) Avail: NTIS HC A13/MF A01

The synthesis, characterization, and rheological studies of random and graft copolymers which are used as models for mobility control agents in enhanced oil recovery are reported. The following procedures are studied. macromolecular syntheses

of model polymers, dilute solution viscosity, aqueous size exclusion chromatography, and laser light scattering

N82-15546# Sandia Labs , Albuquerque, N Mex SANDIA PROGRAM IN GEOTHERMAL TECHNOLOGY DEVELOPMENT

J R Kelsey and B C Caskey 1981 4 p refs Presented at the Geothermal Resources Council Ann Meeting, Houston, Tex. 25 Oct 1981

(Contract DE-AC04-76DP-00789)

(DE81-025394, SAND-81-1490C, CONF-811015-4) Avail NTIS HC A02/MF A01

The accomplishments of the geothermal research program, the status of current projects, and plans for future activities are presented The program includes R and D in high temperature rock penetration mechanics, drilling fluids borehole mechanics, and diagnostics technology

N82-15552# SRI International Corp., Menlo Park, Calif EXPLORATORY STUDY OF COAL-CONVERSION CHEM-ISTRY Quarterly Report, 20 Jun. 1980 - 19 Sep. 1981 4 Mar. 1981 35 p refs DOE/ET-14855/12) (DE81-016136.

HC A03/MF A01 The mechanism of cleavage of key bond types present in coals, and catalysis of conversion in CO-H2O systems are described. Catalytic carbon-carbon and carbon-oxygen bond cleavage in coal related diphenylmethane and diphenyl ether structures were measured. The homogeneous scission of carbon-oxygen bonds in diphenyl ether structure was also studied The CO-H2O conversion level is obtained with aqueous solutions either at a starting pH above 12 6 or in neutral solutions with water soluble catalysts present. Catalysts, including the potassium or sodium salts of molybdate, chromate, manganate, and tungstate was studied and it is found that all are effective in the 3000 to 6000 ppM range. The nitrate was converted to ammonium ion and formate was detected in the product aqueous phase It is found that catalytic quantities of sodium formate in CO/H2O at

N82-15559# Los Alamos Scientific Lab , N Mex HOT DRY ROCK GEOTHERMAL PROSPECTS, 1981

pH 7 are effective in the conversion

F. Goff, A W Laughlin, J Aldrich, M E Ander, B H Arney, E Decker, J. Gardner, G. Heiken, A. J. Kron, C. M. LaDelfe et al. 1981 5 p refs Presented at the Geothermal Resources Council Ann Meeting, Houston, Tex. 25-29 Oct 1981 (Contract W-7405-eng-36)

(DE81-025305; LA-UR-81-1807, CONF-811015-8) Avail-NTIS HC A02/MF A01

Sites within the USA as candidates for development of a second hot dry rock (HDR) geothermal system were assessed Potential sites examined fall broadly into three categories according to the nature of their thermal anomalies. (1) quaternary magmahydrothermal (volcanic or igneous) systems, (2) regional thermal anomalies of tectonic origin, and (3) prequaternary plutonic and metamorphic complexes. Sites with both electrical generation and direct use potential were considered however, efforts were concentrated on electrical sites.

N82-15560# Pacific Northwest Lab , Richland, Wash WIND SPEED SIMULATION FOR ECONOMIC EVALUATION OF WIND ENERGY CONVERSION SYSTEMS

J V. Ramsdell, G F Athey, and M Y Ballinger Jul. 1981 14 p refs Presented at the 4th U.S. Natl Conf of Wind Eng. Res., Seattle, 26-29 Jul 1981 Submitted for publication (Contract DE-AC06-76RL-01830)

(DE81-030077, PNL-SA-9149; CONF-810742-3) Avail. NTIS HC A02/MF A01

A time series model was developed for the simulation of wind speeds. The model provides for the incorporation of systematic seasonal variation of the mean speed, standard deviation, and correlation of speeds. It also provides for incorporation of the systematic diurnal variation of the mean speed and the standard deviation. As a demonstration of the model capabilities, a number of simulations were using model parameters derived from data previously collected. The results of analyses of both sets of data, the simulated set and the real data, were compared in general the major features found in the analyses of the real data are identifiable in the corresponding analyses of the simulated data. The primary difference between the two data sets is in the frequency of high wind

04 FUELS AND OTHER SOURCES OF ENERGY

speeds. The frequencies of hourly and daily average wind speeds greater than two standard deviations above the mean are underestimated slightly by the model

N82-15593# TRW Energy Systems, Redondo Beach, Calif SAMPLING AND ANALYSIS OF POTENTIAL GEOTHERMAL

SITES Final Report, Apr. 1978 - Apr. 1979

R Sung, G Houser, D Strehier, and K Scheyer Aug 1981 205 p refs

(Contract EPA-68-03-2560)

(PB81-240061. EPA-600/7-81-138) NTIS Avail

HC A10/MF A01 CSCL 081

Information on the physical, chemical and radiochemical data of geothermal manifestations (wells and springs) in areas with the most probable potential for development was documented The information can be used to evaluate control technologies and to ultimately establish emission/discharge standards for the emerging geothermal industry

N82-15604# Brookhaven National Lab , Upton, N Y Dept of Energy and Environment

REAL-TIME COARSE-PARTICLE MASS MEASUREMENTS IN A HIGH-TEMPERATURE/PRESSURE COAL-GASIFIER PROCESS TREATMENT

J Wegrzyn, J Saunders, and W Marlow 1981 7 p Presented at the Conf on High Temp, High Pressure Particulate and Alkali Control in Coal Combust Process Streams, Morgantown, W Va. 3-5 Feb 1981

(Contract DE-AC02-76CH-00016)

(DE81-030039, BNL-29953, CONF-810261-1) Avail NTIS HC A02/MF A01

A sampling system that employs a probe appropriate for direct extracted sampling of erosive range particulate matter from a coal gasifier outlet or a high pressure fluidized bed combustor was constructed. The sampling system consists of four modules (1) a null balance extractive probe with injection through a porous lined tube to minimize wall loss, (2) a stem type virtual impactor to separate coarse from fine particles, (3) a filter tape collector, and (4) a beta gauge total mass detector A stem type virtual impactor separates at ambient gas stream conditions the coarse particles from the sampling stream so that at filtration no condensible vapors, fine particles or reactive gases pass through the filter tape. This system provides coarse particle mass flux data with a time resolution of 30 seconds or better Sampling requirements for high temperature, high pressure aerosols are defined and discussed DOE

N82-15656# Geettingen Univ (West Germany) Inst fuer

GEOMAGNETIC AND MAGNETOTELLURIC SOUNDINGS IN THE AREA OF THE CENTRAL EUROPEAN RIFT SYSTEM Final Report, Jun. 1980

Michael Lee Richards, Urich Schmucker, Erich Steveling, and Juergen Waterman Bonn Bundesministerum fuer Forschung und Technologie Aug 1981 76 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie and EEC

NTIS (BMFT-FB-T-81-111; ISSN-0340-7608) HC A05/MF A01: Fachinformationszentrum, Karlsruhe, West

Germany DM 16

The conductivity structure connected with the Central European rift system was investigated with regard to geothermal energy sources using methods of geomagnetic depth sounding and magnetotelluric sounding Sensors, a data acquisition system, and a software package for data handling and data analysis were developed. During a test campaign in the Leinegraben area and two field campaigns in the Rheingraben area, geoelectric and geomagnetic variations in the period range from 6 seconds to 24 hours were registrated. At base sites in the Rheingraben and the Black Forest, models of the vertical profile of the electrical conductivity were determined, while at sites in between the lateral conductivity variations were investigated. The perturbation of magnetic field in the region of the Rheingraben is strong and frequency dependent. The higher frequencies (low penetration depths) show the influence of the graben sedimentary structure, filling only the narrow graben area, and strong currents along the center of the graben. The lower frequencies (deeper penetration depths) reflect the deeper, probably broader conductivity structure Author

N82-15661# Los Alamos Scientific Lab., N Mex SCHLUMBERGER RESISTIVITY STUDY OF THE JEMEZ

SPRINGS REGION OF NORTHWESTERN NEW MEXICO Chris Pearson and Fraser Goff 1981 5 p refs Presented at the Geothermal Resources Council Ann Meeting, Houston, Tex., 25-29 Oct 1981 (Contract W-7405-eng-36)

(DE81-025302; LA-UR-81-1806, CONF-811015-10) Avail: NTIS HC A02/MF A01

Schlumberger resistivity soundings made in the Jemez Mountains of northwestern New Mexico, near the village of Jemez Springs, are presented Three areas that have potential as low temperature geothermal reservoirs were identified. The areas are characterized by a localized zone of very low resistivity which represents the extent of geothermal water and correlates with the location of hot springs or recent volcanic rocks. Resistivities increase rapidly toward the margins of the anomalies, suggesting either variable porosities or variable temperatures and salinities in the reservoirs DOE

N82-15981# California Univ., Berkeley Lawrence Berkeley Lab Engineering and Technical Services Div GRAD: A TOOL FOR PROGRAM ANALYSIS AND PROGRESS MONITORING

Winifred W S Yen and J Dennis Lawrence Jun 1981 5 p refs. Presented at the Ann. Meeting of the Geothermal Resources Council, Houston, Tex., 25-29 Oct 1981

(Contract W-7405-eng-48)

(DE81-028098, LBL-12820; CONF-811015-14) Avail NTIS HC A02/MF A01

The development and operation of the Geothermal Resource Areas Database (GRAD) is described. The data base was created as part of the National Geothermal Progress Monitor System in 1979 The data base is organized around the concept of a geothermal area and provides broad coverage of geothermal development activities in the United States Sixteen records, covering pre-lease, lease, and post-lease activities are defined for each area. Data collected in the various subject areas are critically evaluated, and then entered into an on-line interactive computer system. The system is publicly available for retrieval

05 ENERGY CONVERSION

Includes photovoltaic, thermoelectric, geothermal, ocean thermal, and wind energy conversion. Also includes nuclear reactors and magnetohydrodynamic generators

A82-10192 Photoacoustic figure of merit for photothermal energy conversion efficiency. D. Cahen (Weizmann Institute of Science, Rehovot, Israel) Optics Communications, vol. 39, Oct. 15, 1981, p. 243-246 15 refs

The photoacoustic signal detected near the non-illuminated back surface of a photothermal converter can be used for comparative studies of the conversion efficiency of the converter. The signal is caused not only by the thermal wave transmitted through the sample, but also by mechanical vibrations of the sample itself. While no absolute absorptance or emittance values can be obtained, the signal reflects the influences of both these quantities on the conversion efficiency. Thus this kind of method may lend itself to quality control of such converters, although direct comparisons between absorbing surfaces on different substrates are still problematic.

(Author)

A82-10450 Waves of energy. F. G. W Smith and R. H. Charlier. *Sea Frontiers,* vol. 27, May-June 1981, p. 139-149.

Possible means for harnessing the energy contained in ocean waves are considered. Problems associated with the low-grade nature of wave energy and the rate at which wave crests approach are pointed out, and simple devices already in use for the supply of energy to bell buoys, whistle buoys and lighted buoys are noted. Attention is then given to wave energy conversion systems based on the focusing of waves onto a narrow ramp leading to a reservoir from which water is released to power a turbine generator, a slightly submerged circular shell which directs waves into its center cavity where waves act to turn a turbine (the Dam-Atoll), a long vertical pipe with an internal valve allowing water to move in an upward direction (the Isaacs wave-energy pump), a turbine located at the bottom of an open-topped pipe (the Masuda buoy), a completely submerged closed air chamber from which runs a large pipe open to the sea, a wave piston which acts by the compression of air to drive a turbine, a massive structure with upper and lower reservoirs (the Russel rectifier), and devices which consist of floating or submerged objects which transfer wave energy to pumps (the Salter duck and Cockerell raft) It is concluded that although wave-powered generators are not likely to become competitive in the near future or provide more than a small portion of world demand, they may be found useful under special conditions.

A82-10958 # Correlation between results of zone method and experiment in radiative heat transfer. A. J Sistino (Argonne National Laboratory, Argonne, IL). American Society of Mechanical Engineers and American Institute of Chemical Engineers, National Heat Transfer Conference, 20th, Milwaukee, WI, Aug 2-5, 1981, ASME Paper 81-HT-71 5 p 13 refs. Members, \$2 00, nonmembers, \$4.00. Research supported by the U.S. Department of Energy

The zone method is used to simulate the radiative and conductive heat transfer characteristics of an engineering test facility. The results obtained with the zone method are compared to those measured in the subject facility, and it is found that the theoretical and experimental results agree within five percent when the effective wall emissivity is taken to be 0.25. This effective wall emissivity is the product of the actual wall emissivity times the self-absorption factor of the radiation in the cool boundary layer (Author)

A82-10978 # Application of orthotropic plate theory to windmill blade design. C Rubin (Vanderbilt University, Nashville, TN). ASME, Transactions, Journal of Mechanical Design, vol. 103, Oct. 1981, p. 892-894 5 refs

The windmill blade is treated as a semi-infinite orthotropic wedge with free-free boundary conditions. A closed form solution

for the deflections and stresses is obtained as a function of the loading. The loading may be quite general. Results for three different materials which are commonly used for windmill blades (aluminum, sitka spruce, and fiberglass) are obtained. Applications also include ribbed, corrugated, and layered structures. In addition, other types of boundary conditions may be used to obtain solutions to a wide variety of other orthotropic plate problems. (Author)

A82-11131 The tilting mode in field-reversed configurations. R A Clemente and J L Milovich (Comisión Nacional de Energía Atómica, División Fusión Nuclear, Buenos Aires, Argentina) Physics Letters, vol 85A, Sept 21, 1981, p 148-150 5 refs

Analytical consideration is given to the problem of the stability of plasma equilibria in toroidal field-reversed configurations to the rotation of the symmetry axis inside the separatrix (the tilting mode). The energy principle is applied to an axisymmetric configuration of an ideal plasma in which the plasma reaches the separatrix in the form of a revolution ellipsoid, and for which the equilibrium is described by Hill's vortex solution to the poloidal flux function Analytic growth rates for the tilting mode are obtained as a function of the elongation of the separatrix, and it is found that the prolate field-reversed configurations are unstable to the tilting mode, while spherical configurations are neutrally stable and oblate configurations are stable. Results confirm the studies of Rosenbluth and Bussac (1979) on the MHD stability of the spheromak.

A82-11389 Net energy analysis of small wind energy conversion systems. B N Haack (Ball State University, Muncie, IN)
Applied Energy, vol 9, Nov 1981, p 193-200 15 refs

The net energy of a small wind electric conversion system is calculated and compared with the net energy of other electricity sources. Net energy is the amount of energy remaining for consumer use after deducting the energy required to find and upgrade the energy source and construct and maintain the electricity generating system A 3 kW rated wind electric system for residential use is examined. The amount of energy obtained from this system is estimated by using a computer-operated simulation model which incorporates wind speeds, residential electricity demands and parameters from the generator, inverter and storage components. The net energy gain for this wind system is better than that of other systems with which it is compared. (Author)

A82-11701 Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volumes 1, 2 & 3. Conference sponsored by ACS, AIChE, AIAA, ANS, ASME, IEEE, and SAE New York, American Society of Mechanical Engineers, 1981. Vol. 1, 1038 p., vol. 2, 1072 p., vol. 3, 533 p. Price of three volumes, members, \$145., nonmembers, \$165.

Topics covered include advanced concept in energy conversion, advanced energy systems, and power systems for aircraft and spacecraft applications. Papers were presented on biomass, efficient building mechanical systems, efficient industrial systems, electrochemical energy conversion, and energy storage, in addition to fossil energy, geothermal power systems, and heat engines and technology applications. Studies on hydrogen, MHD power generation, nuclear power, photovoltaic and solar thermal systems, Sterling cycle engines and technology, thermionics and thermoelectric power generation, and wind power are provided.

M.S.K.

A82-11702 # The economic implications of the exergy and thermal efficiencies of energy conversion systems. H E. Khalifa (United Technologies Research Center, East Hartford, CT). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p 3-8

The paper examines the concepts of first-law (thermal) and second-law (exergy) efficiencies of power generation systems and the manner in which these efficiencies affect the economics of such systems. It is shown that, although the thermal efficiency may provide a preliminary indicator of the unit cost of the energy conversion equipment, it is generally a poor measure of the degree of success of the system in utilizing the input energy stream. It is also shown that the exergy efficiency, while not particularly suitable for

05 ENERGY CONVERSION

estimating the equipment cost, provides an excellent measure of the energy source utilization efficiency. A simple methodology is given for combining the two efficiencies to provide some preliminary indications of the optimum design conditions for Rankine cycle energy conversion systems intended for the utilization of low-to-moderate-temperature energy streams such as those produced from geothermal and waste energy sources. (Author)

A82-11720 # A hidden advantage of permanent magnet electrical generating systems. J. J. O'Neill (General Electric Co., Binghamton, NY). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 1.

New York, American Society of Mechanical Engineers, 1981, p. 136-139 7 refs. USAF-supported research.

The development of permanent magnet aircraft electrical generating systems heralds the beginning of a new era. This technique brings many advantages to the user in terms of size, weight and reliability. However, the most significant of these advantages is the extremely high efficiency which is characteristic of these systems. This paper examines the effect of the higher system efficiency on the user, specifically in the area of aircraft fuel consumption. Driven by rising fuel costs, engine and aircraft manufacturers are striving for more efficient performance to minimize life cycle costs. The results of a study which examines the effect of several permanent magnet ratings on different aircraft sizes are presented. (Author)

A82-11747 # Development of space reactor core heat pipes.
K L Meier, H E. Martinez, and J. E. Runyan (California, University,
Los Alamos, NM). In Intersociety Energy Conversion Engineering
Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings
Volume 1 New York, American Society of
Mechanical Engineers, 1981, p. 296-301, 6 refs

The Space Power Advanced Reactor (SPAR) core heat pipes are being developed to transport 15 kW of power at 1400 K. A straight, 2-m-long, 15 9-mm-diam heat pipe was fabricated of low-carbon arc-cast molybdenum and filled with sodium as the working fluid This nonconcetric, annular, screen-tube-wick pipe was tested successfully at 16-1 kW at 1310-K, at which point a boiling limit was encountered Follow-on work has produced an as yet untested heat pipe which has its wick centered in the evaporator by spacer wires to alleviate the boiling limit problem. A dual artery wick heat pipe is being fabricated to further improve on the boiling limit and increase redundancy. Because the heat pipe must bend around the radiation shield of the SPAR reactor, a series of bending experiments was performed Promising results were achieved by filling the pipe completely with sodium and bending at 365 K. The solid sodium acted as a soft mandrel, allowing the wick to bend 90 deg on a 180-mm radius with neither large compression buckles nor tension tears

A82-11748 # Heat pipes for NEP spacecraft radiators. D. M. Ernst (Thermacore, Inc., Leola, PA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 302-306

The evolution of the NEP spacecraft and radiator over the past two years is traced Radiator to energy conversion system interface designs are presented, as are radiator designs and the development of specific heat pipe hardware. Laboratory test results of a 900 K sodium heat pipe demonstrate that difficult geometrical transitions can be accomplished with heat pipes with flexible arterial wicks.

C.R.

A82-11749 # A compact, efficient thermoelectric module for a space reactor. G Fly (California, University, Los Alamos, NM). In. Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1

New York, American Society of Mechanical Engineers, 1981, p. 307-312, 13 refs

The thermoelectric module for the Space Reactor (SPAR) program is a compact annular unit that provides high heat fluxes with a minimum of heat losses. All interfaces are fully bonded to minimize extraneous temperature drops. In order to reduce stresses within the module, the thermoelectric material is circumferentially segmented and a radial stress relief member is provided. An enhanced

silicon-germanium material allows high temperature operation and provides a high figure-of-merit. By using a titanium silicate sublimation coating, the hot junction temperature can be increased further. Thus, a module with reasonably high thermoelectric efficiency, high reliability, and low weight is produced. Since 66 of these thermoelectric ring modules comprise a generator, and 90 generators make up the SPAR conversion system, adequate redundancy is also provided. (Author)

A82-11752 # Engineering development testing of the GPHS-RTG converter. R. D Cockfield (General Electric Co., Philadelphia, PA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 321-325.

The GPHS-RTG will provide electrical power for the Galileo orbiter and for the two spacecraft of the International Solar Polar Mission. The RTG weighs 122 lb and deliver power for the duration of a four and one-half year mission, providing approximately 285 watts at the beginning of the mission, declining to approximately 250 watts at the end of the mission. The GPHS-RTG consists of two primary assemblies the General Purpose Heat Source, and the converter. This paper deals only with the converter, and highlights engineering tests that provide support for its design development Among the tests discussed are those of material characterization, component testing, and converter assembly testing. Engineering development testing culminates in performance and environmental testing of an electrically-heated converter. (Author)

A82-11753 # Modular isotopic thermoelectric generator. A. Schock (Fairchild Space and Electronics Co., Germantown, MD) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1.

New York, American Society of Mechanical Engineers, 1981, p. 327-342. 14 refs

A short history of the 10 Radioisotope Thermoelectric Generators (RTG) thus far flown in space, and design and fabrication of a new generation RTG for coupling with the General Purpose Heat Source is presented. The new RTG is modular and can be expanded in 24 W steps to whatever power levels are desired, requiring only modification of the cooling fin dimensions. Each module contains four Pu-23802 fuel pellets and eight elements, and failure of any module requires only replacement of that unit, without disturbing the others, 5% GaP added to the SiGe thermoelectric material has lowered thermal conductivity and raised efficiency from 0.083 to 0.105, hot junctions are at 1000 C, cold at 300 C. Details of the module design and fabrication, the hot shoe, housing, fins, all components and assembly procedures are presented. The modules are designed for initial use on the Solar Polar mission and the Galileo probe, and it is noted that the iridium cladding around the heat source pellets will withstand a planetary crash without breaching. Each module weighs 59 87 lb, has a power density of 4.71 W/lb, and is designed for a seven year mission life.

A82-11755 * # Advances in space power research and technology at the National Aeronautics and Space Administration. J P Mullin, L P Randolph, W R Hudson, and J H Ambrus (NASA, Washington, DC) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 1 New York, American Society of Mechanical Engineers, 1981, p. 355-361

Progress and plans in various areas of the NASA Space Power Program are discussed Solar cell research is narrowed to GaAs, multibandgap, and thin Si cells for arrays in planar and concentrator configurations, with further work to increase cell efficiency, radiation hardness, develop flexible encapsulants, and reduce cost Electrochemical research is concentrating on increasing energy and power density, cycle and wet stand life, reliability and cost reduction of batteries. Further development of the Ni-H2 battery and O2-H2 fuel cell to multihundred kW with a 5 year life and 30,000 cycles is noted. Basic research is ongoing for alkali metal anodes for high energy density secondary cells. Nuclear thermoelectric propulsion is being developed for outer planets exploration propulsion systems, using Si-Ge generators, and studies with rare earth chalcogenides and sulfides are mentioned. Power Systems Management seeks to harmonize increasing power supply levels with inner and outer.

spacecraft environments, circuits, demands, and automatic monitoring. Concomitant development of bipolar transistors, an infrared rectenna, spacecraft charging measurement, and larger heat pipe transport capacity are noted

M.S.K.

A82-11756 # Nuclear electric power for space systems - Technology background and flight systems program. G L. Bennett, J. J. Lombardo, and B J Rock (U.S. Department of Energy, Space and Terrestrial Systems Div., Washington, DC) In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 362-368 7 refs.

The paper discusses past and future uses of radioisotope thermoelectric generators (RTGs) and the dynamic isotope power system which was developed for power levels up to 2 kWe Advantages of using space nuclear electric power are presented, and the five functional parts of a generalized nuclear-reactor space power plant are given Radioisotope thermoelectric generators and the RTG flight system are also discussed. The compact size, light weight, and long life of nuclear powered generators enable the operation of sensing, analytical and communication systems of satellites and other communication systems for long periods of time.

A82-11777 # Recent progress on the development of the Dow hollow fiber sodium-sulfur battery. C A. Levine (Dow Chemical Co., Walnut Creek, CA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1 New York, American Society of Mechanical Engineers, 1981, p. 823-825.

Recent progress in understanding the chemical and electrochemical mechanisms taking place in the Dow sodium-sulfur cell is summarized. The cell is based on using Na ion-conducting glass as the electrolyte. The cell construction is based on thousands of hollow glass fibers in parallel, each filled with sodium and communicating to a common sodium reservoir. The fibers are immersed in the sulfur-sulfide liquid catholyte, and a metal foil adjacent to the fibers acts as the cathode. Research is being carried out on cell performance in lifetime and cell resistance. Some of the research being done on glass, cathode foil, impurities, and safety_is_presented.—Two approaches that have been taken to prevent the internal temperature of the cell from rising above 600 C are described. The first employs a metering orifice to limit the sodium flow, even in the event of a massive failure of the tubesheet. The other uses a ceramic 'sponge' to contain the sodium.

A82-11783 * # The AGT101 technology - An automotive alternative. R. A. Rackley and K. A. Davis (Garrett Turbine Engine Co., Phoenix, AZ). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2 Nev. York, American Society of Mechanical Engineers, 1981, p. 1403-1407. Contract No. DEN3-167.

The Advanced Gas Turbine Powertrain System Development Project is oriented at providing the United States automotive industry the technology base necessary to produce gas turbine powertrains for automotive applications that will have. (1) reduced fuel consumption, (2) the ability to use a variety of fuels, (3) low emissions, and (4) competitive cost/performance. The AGT101 powertrain being developed consists of a regenerated single-shaft gas turbine engine flat rated at 74.6 kW (100 hp) coupled to a split-differential gearbox and a Ford automatic overdrive production transmission. Performance predictions for the AGT101 powertrain represent a 59-percent improvement in mileage estimates over a 1985 conventionally-powered automobile for the combined federal driving cycle.

A82-11805 # Overview of DOE's large stationary Stirling engine development program. K L Uherka, R. E Holtz (Argonne National Laboratory, Argonne, IL), and W. Bunker (U.S. Department of Energy, Washington, DC) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1847-1853.8 refs

This paper summarizes the results to date of a program, sponsored by DOE's Office of Fossil Energy, to develop large stationary Stirling engine power systems. Primary applications for

such power plants include cogeneration and total energy systems, with a major advantage being their ability to employ solid coal and other non-scarce fuels in an environmentally acceptable manner. The major effort in the Stirling engine development program was an industry-based design competition, involving three independent contractual teams. Conceptual designs for state-of-the-art coal-fired Stirling engine systems were developed and all three design teams recommended development of 373 kW modules as base units, which can be coupled together to form individual Stirling engines up to 2238 kW in size Heat transport system design concepts were also developed for integrating engine hot-end sections with coal combustors (Author)

A82-11806 # Conceptual design of a large coal-fired stationary Stirling engine. Mr Schuetz, J Gerstmann (Advanced Mechanical Technology, Inc., Newton, MA), C Bratt, J Berntell (United Stirling AB, Malmo, Sweden), and D. Ernst (Thermacore, Inc., Leola, PA) In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2

New York, American Society of Mechanical Engineers, 1981, p. 1854-1859 8 refs Contract No. DE-AC02-79ET-15207

A conceptual design is presented for a stationary coal-fired Stirling engine sized for power generation in the 400-2200 kW range, suitable for commercial/industrial cogeneration applications. The proposed power plant consists of one or more 500-hp Stirling engines, a coal combustion system and a heat transport system, along with an electric generator and waste heat recovery equipment of conventional design. The U-form engine is placed on top of a fluidized bed combustor, with the crankshaft above the cylinders and heater head, and heat is conveyed from the combustor to the engine heater-head by a two-stage sodium heat pipe. Projections of system performance for the case of an engine heater head temperature of 720 C, engine mean helium pressure of 15 MPa and engine speed of 900 rpm with waste heat utilization result in an overall efficiency of 79%. Based on a system capital cost of \$950-1500/kW(e), an electric power generation cost of \$0.093/kWh is estimated which may be ALW reduced by waste heat utilization

A82-11807 # Conceptual design of 500 to 3000 hp Stirling engines for stationary power generation. W M Toscano, R. Chandrasehkar, A C Harvey, and K. Lee (Foster-Miller Associates, Inc., Waltham, MA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2 New York, American Society of Mechanical Engineers, 1981, p. 1860-1865

Both near term and far term conceptual designs of a 373 kW (500 hp) to 2237 kW (3000 hp) Stirling engine for stationary power generation have been prepared. The recommended near term conceptual design is modular, consisting of a basic Stirling engine cylinder of 100 kW that is easily adaptable to any type of heat input or machine output. The engine output configuration selected is the single crank, narrow V, multicylinder arrangement in which any number of cylinders, in groups of four or five, provide the desired power rating For clean fuel combustion, the prevaporized, premixed, combustion method with exhaust gas recirculation is employed For coal combustion a Wormser Grate two-stage atmospheric fluidized bed combustion system with a high pressure gas circulation loop system is recommended. The predicted overall fuel to electrical energy conversion efficiency varied between 25 and 34 percent, depending on the system configuration (Author)

A82-11808 # Development free-piston Stirling test-bed engine. G R Dochat, N G Vitale, and T M Moynihan (Mechanical Technology Inc., Latham, NY) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2 New York, American Society of Mechanical Engineers, 1981, p. 1866-1874.

The free-piston Stirling Technology Demonstrator Engine (TDE) designed and instrumented to provide data to aid in understanding free-piston Stirling engine operation and performance, is described. It is noted that the system includes instrumentation to measure the internal thermodynamic operation and to permit calculation of system power flows. Near-term testing of the engine will assess three mechanisms for engine loss. It is pointed out that recent testing has demonstrated that the power and efficiency are strong functions of heater head temperature. A maximum power output of 1,800 watts

and a thermodynamic efficiency of 30% have been demonstrated at 450 C and 40 bar C.R.

A82-11812 # Modelling of the jet-stream Fluidyne. G. T. Reader, G. Ivett, P. Gill (Royal Naval Engineering College, Plymouth, England), and P. D. Lewis (Delorean Motor Co., Northern Ireland). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2.

New York, American Society of Mechanical Engineers, 1981, p. 1909-1915. 27 refs.

A summary of findings of a research program dealing with the Fluidyne, a liquid piston Stirling engine, is presented. The Fluidyne can operate in two modes: (1) 'wet', with a contiguous interface between the liquid piston and the working fluid, and (2) 'dry', in which the interface is sealed by a third fluid layer or mechanical float. Successful operation at temperatures below 550 K can only be achieved with a wet Fluidyne. Operation at only 80 deg C allows construction with unconventional heat engine materials such as plastics, glass and wood. The operational cycle of the Fluidyne is briefly described, and it is noted that the total system volume and relative volumes of the expansion, compression, and dead volumes do not remain constant, as they do in mechanical engines. A thermohydraulic model was therefore developed and results are listed, with further investigations still indicated for modelling the flows in the feedback zone, the relative contributions of the two superimposed thermodynamic cycles, and a modelling of the friction forces. M.S.K.

A82-11817 # High temperature cogeneration with thermionic burners. G O Fitzpatrick, E J Britt, and R S. Dick (Rasor Associates, Inc., Sunnyvale, CA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2 New York, American Society of Mechanical Engineers, 1981, p. 1951-1955. 7 refs. Contract No. DE-AC02-76ET-11293

The thermionic cogeneration combustor was conceived to meet industrial requirements for high-temperature direct heat, typically in the form of gas at temperatures from 800 to 1900 K, while at the same time supplying electricity. The thermionic combustor is entirely self-contained, with heat from the combustion region absorbed by the emitters of thermionic converters to be converted to electric power and the high-temperature reject heat from the converters used to preheat the air used for combustion. Depending on the temperature of the process gas produced, energy savings of around 10% with respect to that used to produce the same amount of electricity and heat without cogeneration are possible with present technology, and savings of up to 20% may be possible with advanced converters. Possible thermionic combustor designs currently under investigation include a configuration in which heat is collected by heat pipes lining the periphery of the combustion region, and a fire-tube converter in which combustion occurs within the cylindrical emitter of each converter. Preliminary component tests of these designs have been encouraging

A82-11818 # Thermionic combustor application to combined gas and steam turbine power plants. G. Miskolczy, C. C. Wang, D. P. Lieb (Thermo Electron Corp., Waltham, MA), A. E. Margulies, L. J. Fusegni (Stone and Webster Engineering Corp., Boston, MA), and B. J. Lovell (Brown Boveri Turbomachinery, St. Cloud, MN). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2.

New York, American Society of Mechanical Engineers, 1981, p. 1956-1961. 7 refs Contract No. DE-AC02-76ET-11292.

A design for the insertion of thermionic converters into the wall of a conventional combustor to produce electricity in a topping cycle is described, and a study for applications in gas and steam generators of 70 and 30 MW is evaluated for engineering and economic feasibility. Waste heat from the thermionic elements is used to preheat the combustor air, the heat absorbed by the elements plus further quenching of the exhaust gases with ammonia is projected to reduce NO(x) emissions to acceptable levels. Schematics, flow diagrams, and components of a computer model for cost projections are provided. It was found that temperatures around the emitters must be maintained above 1,600 K, with maximum efficiency and allowable temperature at 1,800 K, while collectors generate maximally at 950 K, with a corresponding work function of 1.5 eV. Cost sensitive studies indicate an installed price of \$475/kW for the

topping cycle, with improvements in thermionic converter characteristics bringing the cost to \$375/kW at a busbar figure of 500 mills/kWh.

M.S.K

A82-11820 # The design of series-parallel connected thermnonic converter arrays. J B McVey, E. J. Britt, G O. Fitzpatrick,
and R. S. Dick (Rasor Associates, Inc., Sunnyvale, CA) In
Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2

New York, American Society of Mechanical Engineers, 1981, p. 1968-1973 9 refs Contract No. DE-AC02-76ET-11293

Thermionic converters are connected together in a series-parallel array in order to provide a useful output voltage. A model is presented to predict the effects of a nonuniform distribution of input power on the performance of such an array. Three cases are considered where (1) the heat flux is uniform, (2) the heat flux nonuniformity is in the direction of series connections in the array. (3) the heat flux nonuniformity is in the direction of parallel connections. The effect of optimizing cesium pressure for the individual converters is also studied. Results show that the heat flux variation in the series direction can cause a 20-40% drop in array output power as compared to a uniform heat input, as well as an unacceptable variation in emitter temperatures. Heat flux variation along the parallel connections without optimizing cesium pressure causes a 38% loss of array output power and very high emitter temperatures in some converters. Optimization of the cesium pressure in this case, however, reduces the output power loss to 12% and gives emitter temperatures which are all within an acceptable range. Thus, given a proper design, series-parallel arrays can be used to accommodate wide ranges of heat input while still delivering good

A82-11821 # Characteristics of CVD silicon carbide thermionic converters. D. B. Goodale, P. Reagan, G. Miskolczy, D. Lieb, and F. N. Huffman (Thermo Electron Corp., Waltham, MA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2

New York, American Society of Mechanical Engineers, 1981, p 1974-1978 5 refs Contract No. DE-AC02-76ET-11292

Development work has recently been undertaken on a thermionic converter for terrestrial applications which employs chemically vapor deposited (CVD) silicon carbide as a protective coating over the CVD tungsten emitter. A 1-in -diam hemispherical converter with an active emitting area of 6 sq cm has been constructed and has undergone over 7200 hours of life testing at an emitter temperature of 1730 K, collector temperature between 800 and 900 K and power output of 2 W/sq cm at 0.25 V A module using four 1-in. hemispherical converters was built to investigate the problems of operating converter arrays, revealing the importance of minimizing interconnecting lead loss. A 2-in,-diam prototype converter was constructed which has so far accumulated over 1700 hours of life tests at emitter temperatures of 1600 to 1700 K in a natural gas fired furnace. As a result of problems with emitter-collector spacing and temperature nonuniformities discovered during testing, a new converter is being designed with a torispherical hot shell-emitter configuration. Composite hot shell-emitter structures have successfully undergone a series of severe thermal and mechanical tests under conditions exceeding any the shell would experience in application. Results indicate that combustion-heated thermionic converters can operate stably at high temperatures for long periods at interesting efficiencies and power densities. S.C S.

A82-11822 # Thermionic application for future air force space power systems. T Mahefkey (USAF, Wright Aeronautical Laboratories, Wright-Patterson AFB, OH). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2 New York, American Society of Mechanical Engineers, 1981, p. 1979-1981. 5 refs.

This paper reviews some of the potential requirements for future military space power systems and summarizes some of the potential advantages of nuclear power for these missions. A brief comparison of solar and nuclear power system performance is presented, and results of recent NASA/DOE/Air Force programmatic planning efforts are described. It is concluded that a high performance (50W/lb), high power (10-100 kW) technology program should be included as an integral part of current DOE and/or future joint agency sponsored space nuclear reactor program. (Author)

A82-11823 * # Advanced high temperature thermoelectrics for space power. A. Lockwood, R. Ewell (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA), and C. Wood (Northern Illinois University, Dekalb, IL). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 1985-1990 7 refs

Preliminary results from a spacecraft system study show that an optimum hot junction temperature is in the range of 1500 K for advanced nuclear reactor technology combined with thermoelectric conversion. Advanced silicon germanium thermoelectric conversion is feasible if hot junction temperatures can be raised roughly 100 C or if callium phosphide can be used to improve the figure of merit, but the performance is marginal. Two new classes of refractory materials, rare earth sulfides and boron-carbon alloys, are being investigated to improve the specific weight of the generator system. Preliminary data on the sulfides have shown very high figures of merit over short temperature ranges. Both n- and p-type doping have been obtained. Pure boron-carbide may extrapolate to high figure of merit at temperatures well above 1500 K but not lower temperature, n-type conduction has been reported by others, but not yet observed in the JPL program. Inadvertant impurity doping may explain the divergence of results reported. (Author)

A82-11824 # Applications of thermoelectrics to geothermal energy conversion. T. S. Jayadev and D. J. Chou (Energy Conversion Devices, Inc., Troy, MI). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 2004-2007.

The results of analytic studies of a geothermal power plant using thermoelectrics is presented, based on earlier studies of a thermoelectric OTEC system. The thermoelectric modules are sandwiched between the flow channels of a crossflow heat exchanger. All units were optimized for efficiency and net power was calculated considering all losses. A sensitivity analysis was performed to consider (1) the rate of geothermal to cooling water flow rates; (2) enhancement factor of the heat transfer surface, (3) the figure of merit of the thermoelectric material, and (4) the multiplier factor of the total cost including fabrication. Enhanced surfaces were found to decrease the specific material cost due to increased heat transfer area. Installation costs were calculated to be \$500/kW, compared to \$2,000 to \$3,000/kW for Organic Rankine Cycle Engines. Charts are presented of various cost factors, efficiency ratios, and power extraction ratios for a 24 C cooling water, 62 C geothermal fluid power plant. M.S.K.

A82-11825 * # Establishment of noise acceptance criteria for wind turbines. D G. Stephens (NASA, Langley Research Center, Hampton, VA), K. P. Shepherd, and F. Grosveld (Bionetics Corp., Hampton, VA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2 New York, American Society of Mechanical Engineers, 1981, p. 2033-2036. 7 refs.

A program is being conducted to develop noise criteria for wind turbines which minimize annoyance and which can be used in design specifications for future machines. The approach consists of presenting wind turbine noise stimuli to test subjects in a laboratory listening chamber. The responses of the subjects are recorded for a range of stimuli which encompass the designs, operating conditions, and ambient noise levels of current and future installations. Results to date have established the threshold of detectability for a range of impulsive stimuli of the type associated with blade/tower-wake interactions. The status of the ongoing psychoacoustic tests, the subjective data, and the approach to the development of noise acceptance criteria are described. (Author)

A82-11826 # The effect of shielding on the aerodynamic performance of Savonius wind turbines. S M. Morcos, M. G. Khalafallah (Cairo, University, Cairo, Egypt), and H. A. Heikel (Helwan University, Cairo, Egypt). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 2037-2040. 7 refs.

The effect of the flat plate shield on the performance of two-bladed Savonius rotor has been experimentally determined.

Tests were carried out in a low speed wind tunnel with a working section of 1 0 sq m. Flat plate shields with various values of plate width and inclination angle were tested in order to determine the optimum configuration. The maximum power coefficient of the Savonius rotor was increased from 0.22 for the case without shielding to 0.34 for the case with an optimum shielding configuration. The addition of a flat plate shield to the Savonius rotor can, therefore, enhance the power coefficient to values approaching the more elaborate wind turbines without affecting the simplicity of the Savonius rotor.

A82-11827 # Performance testing of a Savonius windmill rotor in shear flows. O O Mojola and O E Onasanya (Ife, University, Ile-Ife, Nigeria). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 2041-2046. 8 refs.

The effects of flow shear and/or unsteadiness on the power producing performance of a Savonius windmill rotor are studied. Measurements are made in two laboratory statistically-steady shear flows, and in the natural wind, which is both viscous and unsteady. The measurements were made of the speed, torque, and power of the rotor at a number of streamwise stations for each of four values of the bucket overlap ratio. Flow velocity profiles and graphs of wind shear variation are given. It is concluded that even in the presence of shear, the power coefficient of a Savonius windmill rotor is most strongly dependent on the tip speed ratio. As in inviscid flow, the power coefficient peaked at a tip speed ratio = 0.8. The major effect of shear was to reduce the power coefficient below the inviscid flow level, the magnitude of reduction depending on the magnitude of shear present. In field testing of the Savonius rotor, the unsteadiness of the wind proved to be a greater source of power loss than the wind shear.

A82-11828 # An overview of fatigue failures at the Rocky Flats Wind System Test Center. C. A. Waldon (Rockwell International Corp., Golden, CO) In. Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2 New York, American Society of Mechanical Engineers, 1981, p. 2047-2052.

Common mode structural failures discovered at the Rocky Flats Small Wind Energy Conversion System (WECS) Test Center are discussed. Each field tested system underwent at least one 80-125 mph wind storm, and a 40% failure rate is reported. Causes of fatigue failure were determined to be higher than expected loadings, vibrational loading excited within operational range (fundamental frequencies are equaled by operational frequencies), unsupported thin materials, stress risers caused by sharp edges and threads, poor quality assurance on fabrication, welding, and handling, and voids or cracks in cast parts (lack of X-rays). Numerous examples are listed for various wind systems. It is noted that although standard procedures are used for verifying individual components of a WECS, problems often occur when the individual parts are interfaced on a high speed machine in what is often a turbulent environment, Computer programs have been developed to aid in quality assurance testing, and can be used by manufacturers who cannot afford extensive testing procedures and apparatus.

A82-11829 # A vertical axis cyclogiro type wind-turbine with freely-hinged blades. D A. Bayly and J. A C. Kentfield (Calgary, University, Calgary, Alberta, Canada). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. York, American Society of Mechanical Engineers, 1981, p. 2053-2059. 13 refs. Research supported by the Algas Resources, Ltd.

A description is given of the design, construction and testing of a prototype vertical axis cycloturbine. The machine has straight vertical blades of symmetrical cross-section. Each blade is hinged, on a vertical axis, near its upper and lower extremities to the ends of radial arms projecting from a central, rotating, tower structure. What is believed to be a unique method is used for the control of blade articulation. The cyclic motion of each blade is derived solely from a combination of the centrifuging action of a mass attached to the blade and the aerodynamic load acting on the blade. Results of open-air tests of the small two-bladed prototype unit resulted in the achievement of a maximum power coefficient of 0.37 at a velocity

05 ENERGY CONVERSION

ratio of 3.6 with a runaway velocity ratio of 5.2. The machine was found to self-start easily. (Author)

A82-11831 # Design considerations for small wind energy conversion and storage systems. G. C. Chang (Cleveland State University, Cleveland, OH). In. Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1981, p. 2070-2074. 6 refs.

A small wind turbine generator system capable of providing electricity to an all electric residence is considered. A host of major design considerations are examined. These include the characteristics of a wind turbine generator, the nature of the electric load demand, the available wind resources, siting considerations, and other related socioeconomic factors. The energy storage subsystem is singled out for detailed treatment because of its high cost and relative importance. Preliminary systems design for a 10-kilowatt wind turbine generator system with energy storage has been effected Performance analysis of such a system has been done using actual hour-by-hour wind data for three specific sites. Results from these analyses are presented to illustrate the importance associated with major design considerations. (Author)

A82-11832 # Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems. A. R. Landgrebe (U.S. Department of Energy, Washington, DC) and S. W. Donley '(Aerospace Corp., Germantown, MD) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 2. York, American Society of Mechanical Engineers, 1981, p. 2075-2080. 11 refs.

A literature review on electrochemical storage techniques related to ocean thermal (OTEC) and wind energy conversion systems (WECS) is presented. Battery use for WECS is foreseen because of siting size, variable capacity, quiet operation, and high efficiency, high cost and the necessity for further input voltage regulation is noted, as are prospects for technology transfer from existing programs for photovoltaic panel battery development. Fuel cells, which can run on hydrogen, ammonia, methanol, naphtha, etc., are encouraging because capacity increases are possible by simple addition of more fuel, and high thermal efficiency. Electrolytic use is seen as a cheap replacement source of electricity for metals refining and brine electrolysis. Systems of energy 'bridges' for OTEC plants, to transmit power to users, are reviewed as redox-flow, lithiumwater-air, and aluminum batteries, fuel cells, electrolytic hydrogen, methane, and ammonia production, and the use of OTECs as power sources for floating factories. Directions of future research are indicated, noting that WECS will be in commercial production by 1985, while OTEC is far term, around 2025

A82-11833 # Regenerative pyroelectric heat engine. R. B. Olsen and J. M. Briscoe (Power Conversion Technology, Inc., San Diego, CA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2081-2085. 12 refs. Research supported by the U.S. Department of Energy.

A single-stage regenerative pyroelectric heat engine has been built and tested. The pyroelectric engine converts heat directly into electrical energy. The efficiency of the conversion process was directly measured (the first such measurement for any pyroelectric conversion process). The measured 0.4% efficiency is 20 times larger than the so-called van der Ziel limit. Further improvements of efficiency are discussed. The engine's power density (at 0.13 Hz) was 17 Watt per liter of ferroelectric material. This early progress indicates that multi-staged pyroelectric engines operating at higher frequencies may achieve 2 kWe per liter with efficiencies of 10% to 20%. (Author)

A82-11840 # Nuclear reactor closed Brayton cycle space power conversion systems, J. P. Layton In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2119-2121.

The history, status, and future prospects for use of nuclear reactor closed Brayton cycle (cBc) spacecraft power conversion

systems is presented. It is noted that the only working nuclear space power system presently in existence is used for thermoelectric power conversion in the 10-100 kWe output. Many missions have been identified that would require high power reactors, including civilian and military communications platforms, operational space and lunar stations, power and microwave relay stations, and eventual solar system and interstellar exploration. Nuclear cBc reactors are considered well suited to requirements over 100 kW to a few MW Noble gases (He and Ar) are circulated through heat exchangers to power electrical turbines, with all components in hermetically sealed casings and shafts rotating on hydrodynamic foil bearings. Development of new, long-life high temperature materials is considered necessary for cBc employment in space applications. An extensive design and software development program is recommended, to be compared on-line with progress of other systems being considered for the same missions.

A82-11852 # Brayton cycle using dissociating nitrosyl chloride. K. Kesavan (Westinghouse Electric Corp., Advanced Reactors Div., Madison, PA) and J. F. Osterle (Carnegie-Mellon University, Pittsburgh, PA). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2204-2209. 13 refs.

A study of the Brayton cycle with dissociating nitrosyl chloride (NOCI) as the working medium is reported. With the turbine inlet conditions of the gas in a highly dissociated state (a mixture of NOCI, NO, and CI2) and the compressor inlet at the combined state (NOCI), the dissociating NOCI cycle shows superior overall performance when compared with the Brayton cycle based on inert gases such as helium. The results of the analysis show considerable potential for reduction in power generation costs through higher cycle efficiencies and smaller component sizes. (Author)

A82-11853 # Advances in coal fired MHD generator research. J. K. Koester (Stanford University, Stanford, CA). In. Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3.

New York, American Society of Mechanical Engineers, 1981, p. 2210-2213. 13 refs. Research supported by the Electric Power Research Institute.

The results of a decade of research on direct coal-fired magnetohydrodynamic generator systems is summarized. Channel operation with thin molten slag deposits benefited from the resulting thermal barrier at the expense of electrical problems due to the ionic conduction behavior of molten slag. Slag induced anode corrosion problems have been reduced by both cold arc-mode electrodes and by high temperature diffuse mode electrodes. Axial shorting induced by cathodic slag polarization has been suppressed by careful insulator/electrode design. The successful operation time of MHD generators under coal-fired conditions has increased from 1/2 hour to over 500 hours. (Author)

AB2-11854 # Status report on MHD generator materials. B. R. Rossing and L. H. Cadoff (Westinghouse Electric Corp., Pittsburgh, PA). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3.

New York, American Society of Mechanical Engineers, 1981, p. 2214-2216. 12 refs.

The development of materials for the MHD generator has historically been cited as a major technical obstacle in the development of commercial coal-fired MHD electrical power generation. Serious effort has been in progress over the last five years to develop and test coal fired MHD electrodes and materials. Two main approaches have been taken; first, the operation of 'cold' electrode walls that are coated with a thin coal slag layer and, secondly, the operation of 'super-hot' electrode walls that operate above the dew point of the slag. Progress using both of these approaches to MHD generator design and operation will be reviewed. (Author)

A82-11857 # Semiconductor converters/inverters for photovoltaic power supply. P. Longrigg (Solar Energy Research Institute, Golden, CO). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2233-2238.

The two generic types of DC to AC inverters are discussed, considering inherent problems and prospects for solution. A current source converter uses reference current from the AC utility line to chop the DC into AC using four thyristors as switches. Difficulties exist in that DC current contains lagging quadrature currents and are harmonics rich. Solutions are indicated in the form of tuned filters for controlling harmonics and a static VAR generator for the quadrature demand, except that solving the quadrature problem reintroduces further harmonics. In the voltage-sourced converter, which performs much like a synchronous generator, harmonics are also present and can be eliminated with pulse-width modulation. However, at lower powers, switching accelerates beyond attainable switching speed levels. Finally, a current-fed, force commutated converter is described which commutates ahead of the AC voltage, it may need special filters or buffers in addition to harmonics filters Further studies are recommended in areas of cost reductions, interface overvoltage protection, harmonics, source stability, safety and code requirements, and utility system protection, all pertinent to photovoltaic power conditioning Circuitry diagrams and AC V-I M.S.K. graphs are provided

A82-11859 # Variable speed wind turbine control system, E. Conley (Michigan State University, East Lansing, MI). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3.

New York, American Society of Mechanical Engineers, 1981, p.

2243-2247.

Variable speed wind turbine operation offers potential increased energy production if the turbine rotor is controlled to operate at constant blade tip speed to wind speed ratio. Two variable speed control systems are compared to a constant speed control system during field tests of a 5m Darrieus type wind turbine generator. Data indicates that a simple variable speed control scheme using wind rotor RPM as the single input signal can control the Darrieus test machine to operate at roughly constant blade tip to wind speed ratio and thus maximize energy production (Author)

A82-12113 * # Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification. A. K. Gupta, J. M. Beer, J. F. Louis (MIT, Cambridge, MA), A. A. Busnaina, and D. G. Lilley (Oklahoma State University, Stillwater, OK). In Fluid mechanics of combustion systems, Proceedings of the Fluids Engineering Conference, Boulder, CO, June 22, 23, 1981.

New York, American Society of Mechanical Engineers, 1981, p. 179-189. 19 refs. Contract No. DE-AC01-79ET-15518; Grant No. NA63-74.

The paper describes a computer code for calculating the flow dynamics of a constant-density flow in the second-stage trumpet shaped nozzle section of a two-stage MHD swirl combustor for application to a disk generator. The primitive pressure-velocity variable, finite-difference computer code has been developed for the computation of inert nonreacting turbulent swirling flows in an axisymmetric MHD model swirl combustor. The method and program involve a staggered grid system for axial and radial velocities, and a line relaxation technique for the efficient solution of the equations. The code produces as output the flow field map of the nondimensional stream function, axial and swirl velocity. It was found that the best location for seed injection to obtain a uniform distribution at the combustor exit is in the central location for seed injected at the entrance to the second stage combustor.

P.T.H.

A82-12666 Ionization waves in an argon discharge in a longitudinal gas flow. Iu J Grigorian, A. E. Martirosian, M. Novak, V. O. Papanian (Akademiia Nauk Armianskoi SSR, Institut Fizicheskikh Issledovanii, Yerevan, Armenian SSR), and M Chvoika (Ceskoslovenska Akademie Ved, Fyzikalni Ustav, Prague, Czechoslovakia, Akademiia Nauk Armianskoi SSR, Institut Fizicheskikh Issledovanii, Yerevan, Armenian SSR). (Fizika Plazmy, vol. 6, Nov.-Dec. 1980, p. 1357-1360.) Soviet Journal of Plasma Physics, vol. 6, Nov.-Dec. 1980, p. 744-746 18 refs. Translation.

An experimental study of the generation of ionization waves in a longitudinal gas flow with velocities of 0-30 m/s and pressures of 1-30 torr is reported, the study has reference to certain processes in gas lasers and MHD generators. It is shown that in a longitudinal stream of argon the phase velocity of ionization waves is not the simple sum of gas velocity and wave velocity in the gas at rest, but

depends nonlinearly on the stream velocity. Standing ionization waves were found to appear when a zero phase velocity was obtained. Attention is given to the existence of a homogeneous positive column and regular and irregular self-excited ionization waves in relation to discharge current, pressure, and gas flow velocity.

B.J.

A82-12897 Increasing power and efficiency by dynamic suppression of ionization instability in a plasma. A P Vinogradov and V. S. Filinov (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). (Teplofizika Vysokikh Temperatur, vol. 19, Mar.-Apr. 1981, p. 399-406.) High Temperature, vol 19, no. 2, Sept. 1981, p. 295-301. 10 refs, Translation.

The dynamic method for suppressing ionization instability is studied. The efficiency of MHD devices operating in the Faraday switching mode with developed ionization instability is compared with the efficiency of an MHD device operating under conditions of dynamic suppression of ionization instability. It is shown that when the external circuit parameters are suitably chosen, there is a gain in the electric and polytropic efficiency as well as in the power of an MHD device operating under conditions of dynamic suppression of ionization instability. The possible practical implementation of the dynamic method of ionization instability suppression with the aid of power semiconductor instruments is assessed

C.R.

A82-12938 Evaluation of organic acids as fuel cell electrolytes, J Ahmad, T. H. Nguyen, and R. T. Foley (American University, Washington, DC) Electrochemical Society, Journal, vol. 128, Nov. 1981, p. 2257-2261. 9 refs, Grant No. DAAK70-77-C-0080.

The electrochemical behavior of methanesulfonic acid, ethanesulfonic acid, and sulfoacetic acid as fuel cell electrolytes was studied in a half-cell at various temperatures. The rate of the electro-oxidation of hydrogen at 115 C was very high in methanesulfonic acid. The rate of the electro-oxidation of propane in all three acids was low even at 135 C. Further, there is evidence for adsorption of these acids on the platinum electrode. It was concluded that anhydrous sulfonic acids are not good electrolytes, water solutions are required. Sulfonic acids containing unprotected carbon-hydrogen bonds are adsorbed on platinum and probably decompose during electrolysis. A completely substituted (fluorinated) sulfonic acid would be the preferred electrolyte. (Author)

A82-13847 † Unconventional techniques of energy conversion (Netraditsionnye sposoby preobrazovaniia vidov energii). Iu. S Bortnikov, N. S. Lidorenko, G F. Muchnik, S V Riabikov, and D. S. Strebkov. Akademiia Nauk SSSR, Izvestiia, Energetika i Transport, Sept.-Oct. 1981, p. 3-12. In Russian.

The current status and future prospects of various unconventional energy technologies are examined. Consideration is given to geothermal, wind, ocean, thermoelectric, and hydrogen-based systems. Optimal design strategies and production plans for such systems are briefly discussed.

B J.

A82-14007 # Utility operating strategy and requirements for the wind power forecast. W. Dub and H. Pape (Regensburg, Universitat, Regensburg, West Germany). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2539. 10 p. 10 refs,

The commitment of a generation system including wind energy conversion systems will be based on wind speed and wind power forecasts. Forecasts for time spans of equal length with the startup/shutdown times of conventional units will be of great importance. The paper discusses forecast horizons up to 3 hours and 6 hours respectively. In addition, the problem of getting good wind speed forecasts is investigated by fitting time series models to wind speed data. Finally, the impact of hypothetical perfect forecasts on the commitment of intermediate load units is demonstrated by means of the wind power variations within spans up to 3 hours.

(Author)

A82-14011 # Proposed 12.5 MWe shelf-mounted OTEC pilot plant for power, water and mariculture at St. Croix. M S Jones, Jr. (Ebasco Services, Inc., Newport Beach, CA), P. E. Slattery (Ebasco Services, Inc., New York, NY), W. L. Green (J. Ray

05 ENERGY CONVERSION

McDermott and Co, Inc, New Orleans, LA), P. J. Bakstad (TRW, Inc., Redondo Beach, CA), and T. R. Blake (Virgin Islands Water and Power Authority, St. Thomas, VI). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec 1-3, 1981, Paper 81-2546 11 p. 14 refs.

The U.S. Virgin Islands has developed a plan to use OTEC to generate electricity and fresh water, and to supply nutrient rich deep seawater for land based mariculture and aquaculture facilities Projects of this nature have the potential to ameliorate shortages of food, fresh water, and energy which limit the possibilities of improving life for inhabitants in many of the world's tropical islands. The project has been sized to produce 12.5 MW of electricity, up to 5 million gallons per day (MGD) of fresh water and 50 MGD of deep seawater. Its output would offset between 400,000 and 475,000 Bbl/yr of petroleum products derived from imported oil currently used to generate electricity and desalination. (Author)

A82-14012 # Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants. G. L. Dugger, D. Richards, F. C. Paddison, L. L. Perini, W. H. Avery (Johns Hopkins University, Laurel, MD), and P. J. Ritzcovan (U.S. Department of Energy, Div. of Ocean Energy Technology, Washington, DC). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2547. 11 p. 20 refs. Research supported by the U.S. Department of Energy

Products other than electricity from OTEC power plants are explored. Noting that the highest temperature gradients with the least seasonal variability are situated in tropical waters, it is suggested that portable products, such as NH3, liquid H2, methanol, and liquid hydrocarbon fuels, in addition to metals refining, are the most attractive applications of OTEC power Cost estimates are provided for each product based on an average annual temperature change of 23.9 C and a 325 MWe OTEC, the eighth plant costs are projected at \$1,280/kW. Slowly cruising platforms for OTEC systems will have higher annual average temperature gradients than moored plants, and seasonal variations will relegate the monetary value of some OTEC electricity to fuel avoidance costs, due to lower winter gradient differences Geothermal OTEC plants' performance is examined and found to exceed the normal OTEC efficiency by 12%.

A82-14016 # Cost estimates for advanced/innovative wind energy conversion systems /AWECS/. E W. Jacobs (Solar Energy Research Institute, Golden, CO). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2557 5 p 7 refs

Three computer models for determining the economics of advanced wind energy conversion systems (AWECS) in production status are discussed. The SAMICS program, designed for estimating costs of production-line operations, includes details of expenses for a plant in steady-state operation, and yields results in terms of prices, quantities, and a breakdown of cost components. The PRICE model gives cost estimates for electromechanical hardware systems, and comprises design, manufacturing, and subassembly costs. The FAST program derives costs of energy systems in terms of construction and installation. All three models provide production costing, and it is noted that the FAST model can be used as an adjunct to the other two. Small WECS are viewed to become commercially viable at the 10,000 units/yr production level, using a one product job shop mode Examples for existing 40 kW and 10 kW preproduction model SWECS are provided and a price lowering curve is generated which is similar to a learning curve

A82-14017 # A modular simulation model for a wind turbine system. S. Bergman (Sydkraft AB, Malmo, Sweden), S. E. Mattsson, and A B. Ostberg (Lund Institute of Technology, Lund, Sweden) American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2558. 9 p. 9 refs.

A mathematical simulation model for a large horizontal axis wind turbine system is presented. The model is intended for simulation of the synchronization of the wind turbine generator against the utility grid and the operation of the wind turbine system under different wind conditions and with different control algorithms. Particular attention has been given to the modularization. The model is divided into subsystems to make it easy to modify the model and adapt it to systems of similar type. The interactive

simulation package SIMNON which allows good structuring and programming in a high level language has been used (Author)

A82-14018 # Wind turbine assisted diesel generator systems. L. A. Schienbein (DAF Indal, Ltd., Mississauga, Ontario, Canada). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2559. 8 p

The need to reduce the cost of energy in remote communities served by diesel generators has led to the investigation of the use of wind energy to replace some or all of the fuel consumed. The development of wind-turbine-assisted diesel generators in Canada has progressed from the design and testing of a 12-kW unit to the design of a prototype 100-kW wind turbine diesel hybrid. This paper presents the results of the 12-kW tests and the implementation of the test results, and the results of further engineering and cost analyses in the design of a prototype 100-kW wind turbine diesel hybrid system. The value of wind energy in a wind turbine diesel hybrid is greatly improved if the diesel generator system itself is designed to operate more efficiently at part load, with or without wind power assistance. Excess wind energy and wind turbine power fluctuations (which result in voltage and frequency fluctuations) can be minimized by selecting the best rotor operating speed. (Author)

A82-14019 # Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation. F. Luft and D. Cromack (Massachusetts, University, Amherst, MA) American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2560 6 p

Presented are a method for evaluating the aerodynamic performance of wind turbine rotors during constant RPM (varying tip-speed-ratio) operation and a summary of the results of a parametric study for optimization of the rotor using this method. The proper choice of rotor RPM is discussed as well as the comprehensive method for evaluating the power coefficient versus tip-speed-ratio curves for various rotors. The power coefficient vs tip-speed-ratio curve for any rotor is combined with wind velocity probability data in a manner which yields a monthly productivity value. A summary of the results of the parametric performance study of linear-taper linear-twist blades is presented, including the shape of the blade yielding the maximum productivity along with a sensitivity analysis. (Author)

A82-14020 # Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands. L. E. Dunbar (ADVANTECH Corp., La Jolla, CA) and G. L. Chan. American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2561.9 p. 8 refs.

A preliminary conceptual design of a 10 MWe OTEC pilot plant has been proposed for the island of Saipan in the Commonwealth of the Northern Mariana Islands. This unique small OTEC plant is intended as a prototype for commercial plants in the small Pacific Island territories and nations. The system concept minimizes local construction to accommodate a lack of local skilled labor and facilities. The baseline design is a concrete barge-mounted plant built in Portland, Oregon, towed to Saipan, and permanently anchored in near-shore shallow water. Details of key subsystem design features are provided including a bottom-mounted cold water pipe, modular power subsystem, and wave shield for storm protection. The results of economic analyses are presented to illustrate the cost competitiveness of electricity from the OTEC plant compared to the current oil-fired diesel units in Saipan. (Author)

A82-14025 # The transformation of wind energy by a high altitude power plant /HAPP/. G. Riegler, W. Riedler, and E. Horvath (Graz, Technische Universitat, Graz, Austria). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2568. 8 p. 9 refs.

Design considerations for a high altitude power plant (HAPP) are discussed. A HAPP has a generator platform supported by a balloon, a tethering and conduction cable, and a ground station for control and energy distribution. Each streamlined balloon would

carry six symmetrically arranged wind turbines and could be raised or lowered by a ground winch in response to 4 hr meteorological forecasts. A double bladed, variable pitch, horizontal axis rotor was chosen for HAPP application in the jet stream at 8,000-10,000 m height. Humidity and icing are calculated to be within tolerable limits, higher winter and lower summer heights are indicated. Optimization studies for 2, 5, and 7 MW turbines are presented, and rotor diameters are found to be limited to 40 m for weight considerations. Pilot plant, production, and operating costs are estimated to result in a cost of energy of \$0.093/kWh, with the He leakage being the biggest expense.

A82-14026 # The stability of a tethered gyromill. D C. Rye, B. W. Roberts (Sydney, University, Sydney, Australia), and J. Blackler. American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2569 10 p. 6 refs.

It has been proposed that electricity could be generated from upper atmospheric winds using a tethered rotary winged craft known as a gyromill. The paper investigates the static and dynamic stability of such a craft when hovering at limited altitudes. Two static stability criteria are presented, one pertaining to short cables, and another to longer cables. A mathematical model is developed to examine the dynamic behavior and several numerical solutions presented. Two modes are identified, a pitch mode and a pendular mode. It is found that the pendular mode may be divergent or non-divergent, depending on the cable attachment point (Author)

A82-14027 # Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation. K. H Hohenemser and A H. P. Swift (Washington University, St. Louis, MO). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2570. 8 p. 9 refs. Research sponsored by the Solar Energy Research Institute.

A yaw dynamics analysis was developed for a two-bladed horizontal axis wind turbine with passive cyclic pitch variation achieved by letting the blade pair freely oscillate about a common axis with which the blades formed a small prelag angle. This type of rotor was found capable of high yaw rates without imposing vibratory hub moments and without producing noticeable flapping amplitudes. Experiments were conducted with a tail vane stabilized 7 6 m diameter wind rotor driving a three phase alternator tuned and loaded to produce a rotor torque proportional to the square of the rotor speed. Two yaw control systems which replaced the usual blade feathering controls were investigated an active yaw control system using a hydraulic rotor speed governor, and a passive system responding to a combination of rotor thrust and torque. Both systems limited during strong gusts rotor speed quite accurately. The passive system appeared to be more promising because of its greater reliability and because of the greater ease of adapting it to larger size wind turbines.

A82-14028 # Lightning protection for wind turbine electronics. D. L. Begley, C. W. Dodd, and T. M. McCalla, Jr. (Southern Illinois University, Carbondale, IL). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2571. 6 p. 5 refs.

Preventive measures for the protection of wind turbines from lightning strike damage are outlined. Lightning can dissipate up to a billion joules in less than a second while electronic components have tolerances in the microjoule range. Structural members may also suffer damage by mechanical stresses due to parallel conductance of lightning amperage, millions of volts are capable of causing flashovers or ionized arcing through air or poor insulation. Studies are cited to indicate that semiconductor device failures are dependent on pulse duration and amplitude. A solution is offered in the form of lightning ground rods, counterpoises, and interconnections which route lightning strike currents away from all electronics, additional shielding of the central electronics is also suggested. Various layers of protective measures are diagrammed, and the use of a transient suppressor to short excess current to ground is recommended. D.H.K.

A82-14029 # An aeroelastic analysis of the Darrieus wind turbine. E. E. Meyer (Boeing Commercial Airplane Co., Seattle, WA) and C. E. Smith (Oregon State University, Corvallis, OR). American

Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec 1-3, 1981, Paper 81-2572, 12 p. 18 refs.

The stability of a single Darrieus wind turbine blade spinning in still air is investigated using linearized equations of motion. The three most dangerous flutter modes are characterized for a one-parameter family of blades. In addition, the influence of blade density, mass and aerodynamic center offsets, and structural damping is presented.

A82-14030 # Assessment of MHD power plants with coal gasification. M R. DeLallo, Jr., R. E. Weinstein, J. C. Cutting, and W R. Owens (Gilbert/Commonwealth, Reading, PA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2574. 6 p. 5 refs Contract No. DE-AC01-77ET-11058.

An assessment of the operational characteristics and cost of magnetohydrodynamic (MHD) power plants integrated with coal gasification was performed. The coal gasifier produces a slag and sulfur free fuel for the MHD combustor. This clean fuel eliminates slag and sulfur interactions with the MHD topping cycle and simplifies the design of the combustor, the MHD channel, and the heat and seed recovery (HRSR) subsystem components. This may increase MHD and HRSR system reliability and provide the potential for earlier commercial demonstration of MHD. Integration techniques with three advanced medium BTU gasifiers were evaluated and an optimum system defined. A detailed comparison was then performed with a direct coal fired MHD power plant using oxygen enrichment. Results indicate that incorporating a coal gasification process with MHD simplifies system design at the expense of lower overall net plant efficiency and higher levelized cost of electricity

(Author)

A82-14031 # Up- and down-wind rotor half interference model for VAWT. H McCoy and J. L Loth (West Virginia University, Morgantown, WV) American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2579 9 p. 12 refs. Contract No. DE-FG02-80CS-89001.

This paper presents a theoretical aerodynamic performance optimization for two dimensional vertical axis wind turbines. A momentum type wake model is introduced with separate cosine type interference coefficients for the up and downwind half of the rotor. The cosine type loading permits the rotor blades to become unloaded near the junction of the upwind and downwind rotor halves. Both the optimum and the off design magnitude of the interference coefficients are obtained by equating the drag on each of the rotor halves to that on each of two cosine loaded actuator discs in series. The values for the optimum rotor efficiency, solidity and corresponding interference coefficients have been obtained in a closed form analytic solution by maximizing the power extracted from the downwind rotor half as well as from the entire rotor. A numerical solution was required when viscous effects were incorporated in the rotor optimization.

(Author)

A82-14032 # A design for an MHD power plant as a prime mover for a Naval Vessel. M. A Paluszek (Charles Stark Draper Laboratory, Inc., Cambridge, MA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2575 11 p. 21 refs. NSF Grant No 22733

A Magnetohydrodynamic Power Plant, designed to be the prime mover for a Naval Vessel, is presented. The system is an open cycle, fossil fueled, subsonic MHD Faraday generator with directly fired air preheaters. A superconducting electric transmission drives the propellers and a standard naval steam plant is used as a bottoming cycle. The increased overall efficiency achievable with this plant allows a lighter, smaller volume ship to accommodate the same payload and reduces the overall fuel cost of the vessel.

(Author)

A82-14033 # Wind ripple analysis. R E. Akıns (Sandia National Laboratory, Albuquerque, NM). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec 1-3, 1981, Paper 81-2580. 8 p. 6 refs. Contract No. DE-AC04-76DP-00789.

Efficient and economical utilization of wind power will require

05 ENERGY CONVERSION

the ability to measure and ultimately predict the effects fluctuations in the incident wind will have on a wind turbine. In order to quantitatively assess these effects, experimental techniques have been developed which allow analysis of full-scale performance of wind turbines with particular emphasis on the effects caused by turbulence in the incident wind. Examples of these techniques are presented using data from the DOE/Sandia Vertical Axis Wind Turbine (VAWT) program. (Author)

A82-14034 # Aerodynamic loads and rotor performance for the Darrieus wind turbines. I. Paraschivoiu (Hydro-Québec, Institut de Recherche, Varennes, Canada). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2582. 10 p 13 refs

Aerodynamic blade loads and rotor performance are studied for the Darrieus windmill by using a double-multiple streamtube model. The Darrieus is represented as a pair of actuator disks in tandem at each level of the rotor, with upstream and downstream half-cycles. An equilibrium velocity exists in the center plane, and the upwind velocity is higher than the downwind velocity, lift and drag coefficients are calculated from the Reynolds number and the local angle of attack. Half-rotor torque and power are found by averaging the contributions from each streamtube at each position of the rotor in the upwind cycle. An example is provided for a 17 m Darrieus employing NACA blades. While the method is found to be suitable for predicting blade and rotor performance, the need to incorporate the effects of dynamic stall in the model is stressed as a means to improve accuracy.

A82-14036 # Problems and potential for MHD retrofit of existing coal-fired plants. G Berry, C Dennis, T. Johnson, V. Minkov, V. Pearson, and M. Petrick (Argonne National Laboratory, Argonne, IL). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2586. 10 p. 5 refs.

Retrofitting existing power plants with an open-cycle MHD system has been re-examined in light of recent developments in the heat and seed recovery technology area. A new retrofit cycle configuration has been developed which provides for a direct gas-gas coupling, also, the MHD topping cycle can be decoupled from the existing plant for either separate or joint operation. The retrofit concept has been applied to Vermilion Station No. 1, a coal-fired power plant presently in operation. Substantial increases in efficiency have been demonstrated and the economic validity of the MHD retrofit approach has been established.

(Author)

A82-14037 # Industrial applications of MHD high temperature air heater technology. D. P. Saari, J. E. Fenstermacher, L. R. White, and C. L. Marksberry (Fluidyne Engineering Corp., Minneapolis, MN). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2588. 11 p. 39 refs. Contract No. DE-AC01-80ET-15602.

The MHD high temperature air heater (HTAH) requires technology beyond the current state-of-the-art of industrial regenerative heaters. Specific aspects of HTAH technology which may find other application include refractory materials and valves resistant to the high temperature, corrosive, slag-bearing gas, materials resistant to cyclic thermal stresses, high temperature support structures for the cored brick bed, regenerative heater operating techniques for preventing accumulation of slag in the heater, and analytical tools for computing regenerative heater size, cost, and performance. Areas where HTAH technology may find application include acetylene/ ethylene production processes, flash pyrolysis of coal, high temperature gas reactors, coal gasification processes, various metallurgical processes, waste incineration, and improvements to existing regenerator technology such as blast furnace stoves and glass tank regenerators. (Author)

A82-14038 # OTEC ocean system development. D. Hove (Dynamics Technology, Inc., El Segundo, CA) and T McGuinness (NOAA, OTEC Program Management Office, Rockville, MD). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2590 8 p. 17 refs.

Ocean systems embodied in OTEC floating power plant designs

include features beyond present offshore practice. Design aspects of the platform, cold water pipe and mooring systems have been investigated in Government sponsored research programs to establish a technology base for commercial plant development. Recent laboratory tests have provided validation of concepts and design tools, and future programs will include large scale demonstration tests. (Author)

A82-14356 A review of rain erosion problems for aerogenerators. A R. Mortimer (Science Research Council, Rutherford and Appleton Laboratories, Chilton, Oxon, England). Wind Engineering, vol. 5, no. 3, 1981, p. 136-146, 27 refs.

Erosive mechanisms and protective measures available for windpowered generators exposed to rain are examined. Rain erosion is modeled in two stages an incubation phase, when plastic deformation and crack formation occur with no loss of weight, and a phase of actual material loss. Raindrop impact causes a progressive tearing action, which is significant in the erosion of soft, compliant elastomers, light rain over a long time period is noted to cause fatigue. Choosing a protective surface necessitates consideration of both surface impact and the effects on the substrate Metal, polymeric, and composite coatings are discussed, and it is found that softness reduces impact damage, and fine weaves in composites enhances stress concentration corrosion resistance. Continued studies specifically dealing with wind turbine blades are recommended, as current knowledge is derived from existing helicopter and propeller driven airplane data D.H.K.

A82-14357 A first order mathematical model of the lift/drag characteristics of aerofoil sections. G W -W. Pontin (Wesco Windmills, Ltd., England). Wind Engineering, vol 5, no. 3, 1981, p 147-153.

The mathematical model described is believed to represent the lift/drag characteristics of commonly used airfoil sections with an accuracy sufficient for the purpose of wind turbine design. In this model an airfoil profile is characterized by six constants and the effects of roughness and Reynolds number by a further three correction factors in a form suitable for compact digital computer storage and manipulation. (Author)

A82-14358 Wind energy for the Federal Republic of Germany. L Jarass, L Hoffmann, G. Obermair (Regensburg, Universität, Regensburg, West Germany), and A Jarass (Forschungsgesellschaft für alternative Technologien und Wirtschaftsanalysen mbH, Regensburg, West Germany). Wind Engineering, vol 5, no. 3, 1981, p. 154-161.

An evaluation of parameters affecting the operation of large windpowered turbines in conjunction with the electric grid of West Germany is presented. North Sea coastal areas were found to have winds with a 6-7 5 m/sec average at 10-40 m, a lack of a predominant wind direction implies that generator spacing will be uniform in all directions. The 100 m GROWIAN wind turbine is considered as the prototype machine, and will produce an optimum of 3 MW, operating in a range of 5-24 m/sec, with nominal output at about 13 m/sec. Sensitivity studies are outlined for varying levels of coastal and national grid penetration, showing a saturation of the coastal grid would occur with fifteen 300 MW windfarms. Economic analyses indicate that large scale wind electric production is now competitive with conventional central generating plants, while wind energy storage is economical only if storage stays below 1 kW storage for every kW installed.

A82-14359 Energy transfer in wind-assist electric power systems. E. H. Gilmore (West Texas State University, Canyon, TX). Wind Engineering, vol. 5, no. 3, 1981, p. 162-174. 12 refs. Research supported by the U.S. Department of Agriculture.

A model is developed for describing mechanical wind-assist electric power systems operating under steady-state conditions. Representations for operating characteristics of system components are combined with the constraints assumed for the system to produce this model. Descriptions are in the form of torque, rpm pairs for the rotor. Analytic solution methods are discussed and a graphical solution procedure is illustrated. Applications in the areas of design and analysis of systems are considered, and the results of one series of tests on one wind-assist system are considered in terms of model parameters. (Author)

A82-14360 An analytic model of high solidity vertical axis windmills. R. G. Carothers and G. M. Bragg (Waterloo, University, Waterloo, Ontario, Canada). *Wind Engineering*, vol. 5, no. 3, 1981, p. 175-190, 8 refs.

By introducing an induced cross flow to the conventional flow models used for vertical-axis windmills an analytic model for high solidity rotors is developed. Results as predicted by the model are compared with those determined from wind tunnel tests. (Author)

A82-14489 On the efficiency of thermal engines with power output - Harmonically driven engines. V. Fairén (Stanford University, Stanford, CA, Madrid, Úniversidad Complutense, Madrid, Spain) and J. Ross (Stanford University, Stanford, CA) Journal of Chemical Physics, vol. 75, Dec. 1, 1981, p. 5490-5496. 11 refs. Research supported by the U.S. Department of Energy.

In a previous article a model of a heat engine was defined and studied with the purpose of emphasizing the role of inertial effects, particularly their importance in relation to optimization problems. Here the performance of models of heat engines harmonically driven around a state of equilibrium is compared. For the first model, with inertia, the model is defined, its nonlinear response with emphasis on the linear approximation is calculated, and the issues related to the coupling of the thermal and mechanical driving forces are discussed. The influence of increasing values of the mechanical friction coefficient is studied, and it is shown that when this coefficient is small, the work output displays subharmonic resonances that disappear when the friction coefficient increases. In the second model, without inertial effects, no such resonances appear as expected, since these are due only to the inertial terms. (Author)

A82-14844 # A numerical model for the flow within the tower of a tornado-type wind energy system. S. S. Ayad (Solar Energy Research Institute, Golden, CO). ASME, Transactions, Journal of Solar Energy Engineering, vol. 103, Nov. 1981, p. 299-305, 11 refs. Contract No. EG-77-C-01-4042

The optimum performance of a model tornado-type wind energy system is predicted based on the pressure distribution in a tower with a simulated turbine flow. A two equation turbulence model is used to fix the mean pressure values and the three components of wind velocity, consideration is given to different tower geometries and turbine exit flow conditions. The flow is assumed to be incompressible and axisymmetric, and a numerical solution is obtained by employing a finite difference method with a leapfrog scheme on a staggered mesh, with an iterative technique to account for the pressure gradient. A maximum power of 35% of a closed bottom tower was found at a turbine/tower diameter ratio of 0.5. Wind tunnel tests with a scale model agreed well with the predictions.

A82-14845 # One viewpoint concerning unit size in the development of wind turbines. W E. Howell and C. J. Todd (U.S. Bureau of Reclamation, Office of Atmospheric Resources Research, Denver, CO) ASME, Transactions, Journal of Solar Energy Engineering, vol 103, Nov. 1981, p 306-312. 18 refs.

The effects of the size of windpowered generators on the growth of windpower utilization are considered. Noting that previous models have shown that the cost of electricity is negatively correlated with machine size, it is asserted that actual production experience will introduce additional benefits. The study was based on analyses using NASA supplied wind speed frequency distributions, and considers a range of 12-1200 GW of installed capacity at 8 and 10.7 m/sec windspeeds. Experience rates of 95, 90, and 85% were selected and calculations made for the first 0.3, 0.6, 1 2, and 2.4 MW machines of production runs. Highest experience rates favored a 0.6 MW size, and solutions to spacing requirements in windfarms to avoid the effects of wake turbulence are shown to be most economically achieved with machines in the 0.5 MW range. It is concluded that emphasis on medium size wind turbines, 0.3-0.6 MW, presents the least risk and greatest flexibility for rapid development of economically feasible windpower.

A82-15069 Carbonate fuel cell power plant systems. R. M. Reinstrom (General Electric Co., Energy Systems Programs Dept., Schenectady, NY). (Institute of Electrical and Electronics Engineers, Summer Meeting, Portland, OR, July 26-31, 1981.) IEEE Transaction on Power Apparatus and Systems, vol. PAS-100, Dec. 1981, p.

4752-4759. 11 refs. Research sponsored by the U.S. Department of Energy.

Carbonate fuel cells are an attractive means of developing highly efficient power plants capable of achieving low atmospheric emissions. Because carbonate fuel cells can be used with coal derived fuel gases and their operating temperatures allow the use of turbomachinery bottoming cycles, they are well suited for large installations like central utility stations. Presently, system development activity is directed toward evaluating the readiness of gasifier and fuel processor technology, defining candidate cycle configurations, and calculating projected plant efficiencies. (Author)

A82-15070 The electric utility 4.5 MW fuel cell power plant - An urban demonstration. R. A. Bell and R. B. Hayman (Consolidated Edison Company of New York Inc., New York, NY). (Institute of Electrical and Electronics Engineers, Summer Meeting, Portland, OR, July 26-31, 1981.) IEEE Transactions on Power Apparatus and Systems, vol. PAS-100, Dec. 1981, p. 4760-4764.

The fuel cell could offer an attractive power generation option for electric utilities. This paper reviews the electric utilities' efforts to develop this technology including the siting and construction of the 4.5 MW phosphoric-acid fuel cell demonstrator in New York City. The paper concludes that the fuel cell is moving from technology demonstration status toward commercial service in electric utility systems during this decade. (Author)

A82-15071 Potential dynamic impacts of wind turbines on utility systems. H. W. Zaininger and D. J. Bell (Zaininger Engineering Co., San Jose, CA). (Institute of Electrical and Electronics Engineers, Summer Meeting, Portland, OR, July 26-31, 1981.) IEEE Transaction on Power Apparatus and Systems, vol. PAS-100, DEC 1981, p. 4821-4829. 11 refs. Research sponsored by the Electric Power Research Institute.

This paper presents the results of an initial assessment of potential wind power generation dynamic impacts on utility systems from a global utility perspective performed for the Electric Power Research Institute. Dynamic study of minute-to-minute ramping, frequency excursions, and short-term transient stability was performed using the isolated Hawaiian Electric Company (HECO) system as an illustrative example. Potential minute-to-minute ramping requirements imposed on conventional generation units of two interconnected utilities, Kansas Gas and Electric (KG&E) and Public Service Company of Colorado (PSCo) were investigated, using interconnected utility operating criteria. (Author)

A82-15650 Wind-energy recovery by a static Scherbius induction generator. G. A Smith and K. A Nigim (Leicester, University, Leicester, England). *IEEE Proceedings, Part C - Generation, Transmission and Distribution*, vol. 128, pt. C, no. 6, Nov. 1981, p. 317-324 9 refs.

The paper describes a technique for controlling a doubly fed induction generator driven by a windmill, or other form of variable-speed prime mover, to provide power generation into the national grid system. The secondary circuit of the generator is supplied at a variable frequency from a current source inverter which for test purposes is rated to allow energy recovery, from a simulated windmill, from maximum speed to standstill. To overcome the stability problems normally associated with doubly fed machines a novel signal generator, which is locked in phase with the rotor EMF, controls the secondary power to provide operation over a wide range of subsynchronous and supersynchronous speeds. Consideration of power flow enables the VA rating of the secondary power source to be determined as a function of the gear ratio and online operating range of the system. A simple current source model is used to predict performance which is compared with experimental results. The results indicate a viable system, and suggestions for further work are proposed. (Author)

A82-15667 North American tidal power prospects. W. W Wayne, Jr. International Journal of Ambient Energy, vol. 2, July 1981, p. 151-158.

Prospects for North American tidal power electrical generation are reviewed. Studies by the US Army Corps of Engineers of 90 possible generation schemes in Cobscook Bay, ME, indicated that maximum power generation rather than dependable capacity was the most economic method. Construction cost estimates for 15 MW bulb

05 ENERGY CONVERSION

units in a single effect mode from basin to the sea are provided, five projects were considered ranging from 110-160 MW. Additional tidal power installations are examined for: Half-Moon Cove, ME (12 MW, 18 ft tide); Cook Inlet, AK, which is shown to pose severe environmental and engineering problems due to fish migration, earthquake hazards, and 300 ft deep silt deposits; and the Bay of Fundy, Canada. This last has a 17.8 MW plant under construction in a 29 ft maximum tide area. Other tidal projects of the Maritime Provinces are reviewed, and it is noted that previous economic evaluations based on an oil price of \$16/barrel are in need of revision.

M.S.K.

A82-16052 Investigations on a Se-CdO photovoltaic cell. C. H. Champness, S. Fukuda, and S. Jatar (McGill University, Montreal, Canada). Solar Energy Materials, vol. 5, Oct. 1981, p. 391-401. 5 refs Research supported by the Natural Sciences and Engineering Research Council of Canada.

Based on earlier studies of Altmeid and Champness (1978), Se-CdO cells were investigated in order to determine the counter electrode deposition conditions. The cell structures were made by the Preston method using residual air. In this method CdO is reactively sputtered on a crystallized selenium film using a cadmium target in the presence of aroon plus residual air, pressure is critically controlled in order to obtain the appropriate excess of cadmium in the CdO, giving a low resistivity with sufficient transparency. The spectral response is between 350 and 700 nm, and is controlled on the long wavelength side by the selenium and on the short wavelength side by the CdO. The effect of heat treatment of the selenium film in oxygen prior to CdO film deposition raised the open-circuit voltage and fill factor, resulting in a cell giving about 1.7% efficiency, without an optimized grid or antireflecting coating. Preliminary experiments were made to sputter CdO reactively on glass from gas pre-mixtures of oxygen and argon to obtain easier pressure control, these, however, did not give films of low enough resistivity coupled with high transparency

A82-16600 Analytical solution of a simulation model for wind turbines. H M Power (University College, Dublin, Ireland) Applied Energy, vol. 9, Dec 1981, p 311-316

A recently developed model for wind turbine dynamics has the form $J(d \text{ omega/dt}) = g(V, \text{ omega}) \cdot T$, where J represents the moment of inertia of the system referred to the axis of the turbine, T is the torque absorbed by the load, and g(V, omega) is the torque generated by the turbine when rotating at omega radians/sec in a windspeed of V meters/sec. The equation of motion can be used to simulate the behavior of a turbine connected to a load having a parabolic torque versus speed characteristic by approximating any given windspeed versus time profile by a piecewise-constant variation. It is shown that, subject to the stated load, the equation of motion can be solved explicitly for any time interval during which V is considered constant.

A82-16743 Computational analysis of diffuser-augmented wind turbines. C. A. J Fletcher (Sydney, University, Sydney, Australia) Energy Conversion and Management, vol 21, no 3, 1981, p. 175-183. 16 refs Research supported by the Energy Authority of New South Wales and National Energy, Research Development and Demonstration Council

Diffuser-augmented wind turbines are suitable candidates for the generation of electricity from jet-stream winds. A blade element, computational analysis is developed that includes wake rotation effects and blade Reynolds number effects. The influence of the diffuser is allowed for by introducing empirical values for the diffuser efficiency and exit-plane pressure coefficient. Good agreement is obtained for power coefficient and turbine axial velocity with experimental results. The use of screens to simulate the turbine is found to overestimate the turbine output by neglecting blade profile drag but to underestimate turbine output by neglecting favorable rotational influences on diffuser efficiency. Maximum power is delivered with a solidity ratio of 0.10 to 0.15 depending on the aerofoil section used.

(Author)

A82-16827 * # Ceramics for the AGT101 automotive gas turbine. D. M. Kreiner and J. M. Wimmer. Government Institutes, Gas Research Institute, National Coal Association, EPRI, and AGA, Energy Technology Conference, 8th, Washington, DC, Mar 9-11, 1981, Paper. 15 p. Contract No. DEN3-167.

An advanced gas turbine powertrain for automotive application is being developed. Objectives of the program include a fuel consumption of 42.8 mpg on No. 2 diesel fuel in a 3000 pound car, same overall vehicle performance as obtained with a conventional spark ignition internal combustion engine, low emission, multiple fuel capacity, reliability, and competitive cost. The AGT101 power-train consists of a power section, gearbox and transmission, and the design and analysis conducted thus far support the initial engine concept, as no significant design changes have been required. The ceramic rotor design approach and component materials are discussed, and it is projected that the AGT powertrain will be competitive with any other alternative powertrain in meeting the design objectives.

A82-16844 Turbines in the ocean. F G W Smith and R. H. Charlier (Northeastern Illinois University, Chicago, IL) Sea Frontiers, vol 27, Sept.-Oct. 1981, p. 300-305.

It is noted that the relatively high-speed ocean currents flowing northward along the east coast of the U.S. may be able to supply a significant proportion of the future electric power requirements of urban areas. The Gulf Stream core lies only about 20 miles east of Miami, here its near-surface water reaches velocities of 4.3 miles per hour. Attention is called to the estimate that the energy available in the current of the Gulf Stream adjacent to Florida is approximately equivalent to that generated by 25 1,000-megawatt power plants. It is also contended that this power could be produced at competitive prices during the 1980s using large turbines moored below the ocean surface near the center of the Stream. Assuming an average ocean-current speed between 4 and 5 knots at the current core, the power density of a hydroturbine could reach 410 watts per square foot, about 100 times that of a wind-driven device of similar scale operating in an airflow of approximately 11 knots.

C. R.

A82-17015 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries. M Ugai (Ehime University, Matsuyama, Japan) *Plasma Physics*, vol. 23, Sept. 1981, p. 857-867 10 refs.

Distinct hydromagnetic characteristics associated with the tearing-type (Furth etal., 1963) and the Petschek-type (Petschek, 1964) field geometries are studied numerically. Both the tearing-type and the Petschek-type reconnections are initiated by a local resistive disturbance, and develop from an initially antiparallel magnetic field In the tearing-type field geometry the current-sheet plasma, accelerated at X-type neutral points through reconnection, cannot be ejected away from the system, but is confined in the resulting magnetic islands. It is found that the nonlinear saturation oscillates as a result of the interaction between the confined plasma and the surrounding magnetic field, the period of the oscillation is approximately given by the time required for an Alfven wave to cross one wavelength. On the other hand, in the Petschek-type field geometry the plasma can freely be ejected away from the system, so that the antiparallel field is allowed to collapse into the X-type neutral point (Author)

A82-17626 American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Edited by V. Nelson and M. Mooring (West Texas State University, Canyon, TX). Washington, DC, American Wind Energy Association, 1980. 170 p.

The state-of-the-art of large and small wind turbine applications is detailed. Large wind energy conversion systems (WECS) were examined in the light of federal programs, early operational experience with MW sized wind turbines, large Darrieus windpowered generators, legal, institutional, reliability, and cost factors, lightning protection, and implications of PURPA legislation. Evaluation procedures for vibration analysis, yaw dynamics, and hysteresis were discussed for small WECS, along with water heating applications, performance and reliability characteristics, and the aerodynamic performance of small vertical axis WECS. Topics significant to commercialization of WECS were explored, including achievable goals and wind energy assessment techniques, WECS use by rural electric systems, product liability insurance, and standards for WECS.

A82-17627 * # Energy potential and early operational experience for large wind turbines. W. H. Robbins and R. L. Thomas

(NASA, Washington, DC). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 7-12. 9 refs.

Projections for the total potential output of large wind turbines in the U.S. are reviewed. NASA has developed nine large wind-powered generators, of 100 kW, 200 kW, 2 MW, and 2.5 MW capacities, with rotors 100-300 ft in diameter, and all with horizontal axes. Approximately 214,000 sq miles of the U.S. have been determined as having substantial wind regimes and terrain suitable for large wind turbines siting. This translates into 340,000 Mod 2 (2.5 MW) wind turbines producing 4.9 quads of electricity annually, equivalent to saving 2.5 billion barrels of oil/yr. The cost of electricity is seen as the critical factor in utility acceptance of large wind turbines, and the Mod 2 machines are noted to achieve the 2-4 cents/kWh (1977 dollars) COE which is necessary. Problems such as pollution, including visual, auditory, EM, and land use difficulties are considered, and solutions are indicated.

A82-17628 # Alcoa vertical axis wind turbines. H. R. Kutcher (Alcoa Research Laboratories, Pittsburgh, PA). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 13-15.

An introductory line of vertical axis wind turbines which have been designated ALVAWTS is under development and testing. This paper describes those machines, discusses development and commercialization efforts, and provides data for three models which are believed to be cost effective for use today at sites with mean annual wind speeds in excess of 6.3 m/s (14 mph).

(Author)

A82-17629 # Application of large and small wind turbine generators - A utility perspective. M. Klinger, E. J. Warchol, N. G. Butler, M. J. Berger, and R. E. Reinhart (Bonneville Power Administration, Portland, OR). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 16-19.

A82-17630 # Wind energy conversion system design and analysis program. J. S. Foley (United Technologies Research Center, East Hartford, CT). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings.

Washington, DC, American Wind Energy Association, 1980, p. 39-45. 5 refs.

This paper describes a computer program which was developed primarily to guide the design process of a wind energy conversion system, particularly in evaluating system concepts for the minimization of cost of energy (COE) and sizing of a wind system for maximum performance at a given wind site. It is, in effect, a complete preliminary design process which accepts, as independent variables, specifications for a WECS design (rotor diameter, rated power, etc.), and wind site characteristics (mean wind speed and shear profile), and calculates all weights, costs, and energy production quantities to arrive at a complete description of the WECS in either a single-unit or a wind-farm configuration. An important feature of the program is an internal optimization routine which can optimize one or more of four key variables (rotor RPM, rotor diameter, rated power, and tower height) for minimum COE for either a single unit or a wind farm installation. The use of the program in the design process is demonstrated for a Hamilton Standard Multi-Megawatt Wind Turbine and for UTRC's entry in the 15 kW SWECS competition.

A82-17631 # Lightning protection for composite rotor blades. H. W. Gewehr (Kaman Aerospace Corp., Bloomfield, CT). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 46-48.

The development of a lightning protection skin for all-composite windpowered turbine rotors is described. Preliminary tests revealed a necessity for lightning conductors in fiberglass blades, to eliminate high current entry into the interior of the rotor. A woven cloth of aluminized glass fibers was incrementally built up until a 200,000 Amp current could be survived. A full-chord aluminum tip cap and a

coated trailing edge braid on the Mod 1 blades is considered effective protection of up to a 200,000 Amp lightning stroke. Further tests to determine adequate protection for a 40 kW wind turbine are indicated. It is noted that lightning will not penetrate a one inch thick fiberglass composite spar wall if there is no metal inside the spar, lightning will penetrate a .060 in. fiberglass afterbody skin to reach a wet paper core, and lightning conductors must be firmly attached to the structure.

M.S.K.

A82-17633 # Operations of small wind turbines on a distribution system. D. Curtice (Systems Control, Inc., Palo Alto, CA). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 55-59.

The technical aspects of interconnecting a small wind energy conversion system (SWECS) with a utility grid are examined. Four commercially available wind turbines with outputs less than 100 kW were studied, covering the gamut of induction generator, self- and line-commutated inverters, and a synchronous generator. Penetrations of 5, 20, and 50% of the total utility power output were considered. Effects on utility protection equipment coordination were found to be safe with regard to overcurrent devices, noting that a SWECS would respond to a three-phase utility fault. Isolated operation was found to be possible with synchronous and self-commutated SWECS, and a disconnect switch is necessary to protect line workers during repair periods. The growth of SWECS penetration into the total power of a grid is expected to be gradual, and voltage flicker can be fixed by a simple device to prevent sudden large inputs by a SWECS.

A82-17634 # Overview of the Wind Energy Application Network for Hawaii. D. R. Neill (Hawaii Natural Energy Institute, Honolulu, HI). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings.

Washington, DC, American Wind Energy Association, 1980, p. 60-67.

A82-17635 # Enertech High Reliability prototype vibration analysis. J. H. Sexton (Rockwell International Corp., Rocky Flats Plant, Golden, CO). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings.

Washington, DC, American Wind Energy Association, 1980, p. 71-75.

Modal analysis techniques were experimentally applied to study the dynamic interaction between a wind turbine generator and its support tower. Details of the techniques applied and corresponding results are discussed. Results of vibration tests indicate the Enertech High-Reliability wind turbine generator (WTG/support structure) second mode bending was 13.2 Hz, while the blade's first mode bending frequencies were 12.4 Hz for blade two and 14.6 Hz for blade one. Significant WTG/tower response was observed and recorded during WTG operation which was traced to this system response characteristic. (Author)

A82-17636 # Evaluation of wind turbine generator operational hysteresis using 'Method of Bins'. C. A. Waldon (Rockwell International Corp., Rocky Flats Plant, Golden, CO). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 76-80.

A two-dimensional method-of-bins data processing system for a small wind energy conversion system (SWECS) is used to demonstrate the production of a composite power curve. The curve takes into account hysteresis occurring during different wind regimes, and is combined with a Weibull distribution for windspeed and duration for site specific output calculations. An example is provided for a 1 kW horizontal axis SWECS, including modifications to the program to account for blade-pitch and/or tail furling safety mechanisms which prevent SWECS overspeed. The action of hysteresis can be accounted for by including parameters for rotor pitch, tail position, and wind tracking, and requires multidimensional bins for accurate predictions of power output.

A82-17637 # Yaw dynamics of a horizontal axis wind turbine. R. Kirchhoff, D. Cromack, and R. Cohen (Massachusetts,

University, Amherst, MA). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings.

Washington, DC, American Wind Energy Association, 1980, p. 81-87. 5 refs.

The dynamics of horizontal axis wind turbine response in yaw are analyzed. A model is explored consisting of an ellipsoidal nacelle, a ngid pole, no wind shear, and zero coning in the rotor blades. The torque applied to the nacelle and the rotor blades, due to gyroscopic, Coriolis, and damping forces are considered linearly. A coordinate system for the moment of inertia and the angular acceleration is devised, and the pressures on each blade (3 blades in the study) are integrated. The possibility of a coupling between the wind speed and the lowest natural frequency is suggested, and experiments with a non-rigid tower are indicated to examine a configuration where Coriolis forces may dominate.

A82-17638 # Experiences with a Grumman windstream 25. L. H. Soderholm (Science and Education Administration, Ames, IA). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings.

Washington, DC, American Wind Energy Association, 1980, p. 90-92. Features of a new 3-bladed, 15 kW, downwind horizontal axis wind turbine are described. The windpowered generator has passive yaw, a 25 ft blade diameter, is rated at 26 mph, and uses a 20 kW brushless, self-excited alternator. Proper lubricating oil for ambient conditions was found to be necessary to maintain efficient operation in extreme weather conditions. A solid shaft has eliminated low-stress fatigue in the hub-propellor connection, and corrosionproof materials have been incorporated in the blade pitch control limit switches. It is noted that including easy access on the ground to all electronic circuits and circuit breakers enhances the saftey and utility of a small wind energy conversion system (SWECS). It is summarized that the provision of easy installation, safety control redundancy, proper yaw orientation forces, accurate stress evaluation, and proper generator excitation are necessary for the acceptance of SWECS. M.S.K.

A82-17639 # Wind driven fluid devices for water heating. M. Rolland and D. Cromack (Massachusetts, University, Amherst, MA). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 93-95. 7 refs.

Present techniques for analysis of water brake applications to wind energy conversion systems was shown to be inadequate for moderate to large scale wind turbines. Several vaned hydraulic energy converters are compared for size, speed, and capacity to identify devices suitable for wind turbine applications. A parametric relationship is developed to aid the designer in choice of an appropriate device. Examples of specific systems are presented with emphasis on domestic, agricultural, and industrial applications. (Author)

A82-17640 # Development of high-performance, high-reliability windpower generators. K. H. Bergey (Bergey Windpower Co., Inc., Norman, OK). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 101-105.

The BWC 650 and BWC 1000 windpower generators represent a new approach to high-performance and high-reliability for small windpower machines. Their variable pitch rotor system consists of torsionally flexible blades combined with out-of-plane balance weights. The resulting Powerflex blade system provides the performance advantages of variable pitch blades while maintaining fixed pitch simplicity. The permanent magnet alternators used in the two models are designed for low speed operation without the need for step-up gear boxes. The Autofurl tail automatically turns the rotor out of the wind above 32 mph. When the winds subside, it turns the rotor back into the wind. Development problems and testing techniques are discussed, including fatigue testing, dynamic blade angle measurements, and tower tests under actual storm conditions.

A82-17641 # Analytical evaluation of the aerodynamic performance of a high-reliability vertical-axis wind turbine. R. B. Noll (Aerospace Systems, Inc., Burlington, MA) and N. D. Ham (MIT, Cambridge, MA). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings.

Washington, DC, American Wind Energy Association, 1980, p. 106-113. 13 refs. Research supported by the Rockwell International Corp.

The aerodynamic performance of a high-reliability vertical-axis wind turbine is discussed. The turbine has three, straight blades which are cyclically pitched. Due to its unique configuration, aerodynamic performance models used for classical horizontal-axis machines and for the vertical-axis Darrieus wind machines are not applicable. Therefore, an analytical model was formulated for the turbine aerodynamic performance and has been programmed for computer calculation. Both the mathematical model and computer program VAPE (Vertical-axis wind turbine Aerodynamic Performance Evaluation) are discussed. Connections for strut drag, turbulent wake state, and dynamic stall are included. (Author)

A82-17642 # Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique. J. C. Balcerak (Rockwell International Corp., Golden, CO). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 114-119.

The results of tests of small wind energy conversion systems (SWECS) on board moving railroad flatcars are reported. Mounting the SWECS on the flatcars allowed testing at different fixed speeds and orientations. Initial tests determined the power curve of the machines, the wind velocity profile over a flatcar, and the acceleration/deceleration effects on the towers. Testing procedures on the 4000 ft long rail track are described, as are preliminary steps to define wake profiles behind the moving SWECS blades. Power curves for several manufacturers machines are provided, and it is observed that the output of two machines greatly exceeded the manufacturers predictions, due to a continued increase of rotor speed with increasing wind velocity. Continuation and expansion of the moving bed test facility for SWECS is recommeded on a reimbursible basis.

M.S.K.

A82-17643 # First results from the UMass wind tunnel test program. L. W. Slager (Massachusetts, University, Amherst, MA). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings. Washington, DC, American Wind Energy Association, 1980, p. 120-128. 17 refs.

Along with the recently reported theoretical-experimental study comparing lifting line theory (with Reynolds number corrections) predictions to results of wind tunnel model tests of three foot diameter rotors, an ongoing series of tests exploring such effects as pitch angle, coning angle, solidity, number of blades, surface roughness, and tower shadow have been and are being carried out. These tests are being performed on both optimum and nonoptimum (linear taper, linear twist and constant chord, zero twist) horizontal axis rotors. In addition, sailwing and Darrieus-type rotors in various configurations are also being tested. Some results for the above tests will be presented. These results establish the credibility of small model testing and the need for careful rotor design by considering other effects than just twist and chord distribution. They also confirm theory in some cases and are at variance in others. Qualitative explanations (using system dynamics or other variables) are offered and suggestions for future research are made,

A82-17644 # SWECS technology - State-of-the-art and achievable goals. R. P. Cingo (Rockwell International Corp., Pittsburgh, PA). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings.

Washington, DC, American Wind Energy Association, 1980, p. 131-138.

The progress of the development of commercially-ready small wind energy conversion systems (SWECS) is summarized, along with suggestions for applications of improvements. Six commercially available machines and seven DOE prototype SWECS were examined for kWh/yr per lb of material, kWh/yr per sq m of swept area, dollars/lb in manufacture, and cost of energy in cents/kWh. Significant advancements in the economics of SWECS were found with the use of poltruded blades, induction molding techniques, and

aerodynamically controlled rotors. The development of a standard, dual output gaarbox for multiple applications is recommended, as well as cataloguing tower dynamics characteristics, the design of components specifically for SWECS use, and the introduction of low-cost installation procedures, Finally, it is noted that reliability and system life for SWECS are two relatively unknown factors.

M.S.K.

A82-17646 # Performance testing and rating standards for Wind Energy Conversion Systems. M. Bergey (Bergey Windpower Co., Inc., Norman, OK). In: American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings.

Washington, DC, American Wind Energy Association, 1980, p. 163-167.

A82-17889 ° # End region and current consolidation effects upon the performance of an MHD channel for the ETF conceptual design. S. Y. Wang and J. M. Smith (NASA, Lewis Research Center, Cleveland, OH). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Papar 82-0325. 5 p. 6 refs.

It is noted that operating conditions which yielded a peak thermodynamic efficiency (41%) for an EFT-size MHD/steam power plant were previously (Wang et al., 1981; Staiger, 1981) identified by considering only the active region (the primary portion for power production) of an MHD channel. These previous efforts are extended here to include an investigation of the effects of the channel end regions on overall power generation. Considering these effects, the peak plant thermodynamic efficiency is found to be slightly lowered (40.7%); the channel operating point for peak efficiency is shifted to the supersonic mode (Mach number of approximately 1.1) rather than the previous subsonic operation (Mach number of approximately 0.9). Also discussed is the sensitivity of the channel performance to the 8-field, diffuser recovery coefficient, channel load parameter, Mach number, and combustor pressure.

C.R.

A82-17913 # Optical diagnostic techniques for coal-fired MHD applications. D. L. Murphree, R. L. Cook, L. E. Bauman, E. J. Beiting, R. E. Stickel, R. O. Daubach, and M. F. Ali (Mississippi State University, Mississippi State, MS). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meating, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0377. 19 p. 32 refs. Contract No. DE-ACO2-80ET-15601.

Microprocessor-controlled, optical diagnostic instrumentation has been developed for the measurement of gas temperature, gas velocity and turbulence profiles, slag temperature and emissivity, optical transmission, and nitric oxide concentration in the particle/seed-laden, coal-fired magnetohydrodynamic (MHD) gas stream. Both a performance evaluation of these systems on DOE/MHD test facilities and the resulting diagnostic data on MHD/HRSR components are presented. Preliminary results of the Coherent anti-Stokes Raman Spectroscopy technique for spatially and temporally resolved temperature measurements in this harsh MHD environment are presented. (Author)

A82-17914 # MHD coal combustor development. J. Hardgrove, M. Bauer, H. Iwata, and R. Hamberg (TRW Energy Development Group, Redondo Beach, CA). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0380. 10 p. Contracts No. DE-AC22-79ET-11053; No. DE-AC22-81PC-40502.

The development status of 10 and 20 MW(thermal) MHD slagging coal combustors that have been selected by the DOE for scaling to the 50 MW size for integrated power train testing is surveyed. The results of a recently completed endurance demonstration of the 20 MW combustor are also discussed. A summary is given of the various types of coal combustors that have been experimentally evaluated during the past six years in the U.S. and Poland. The design of the combustors involves a cylindrical horizontal vortex flow combustion chamber with tangential oxidizer injection and axial gas outflow. The slag flows essentially under the influence of gas shear and is tapped near the combustor exit. No significant hardware problems have been encountered with the combustor components operating over 271 hours and being subjected to high thermal cycling (more than 400 cycles).

A82-17922 # MHD generator scaling analysis for baseload commercial power plants. D. W. Swallom and C. C. P. Pian (Avco Everett Research Laboratory, Inc., Everett, MA). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0394. 11 p. 5 refs. Contract No. DE-AC01-80ET-15614.

MHD generator channel scaling analyses have been performed to definitize the effect of generator size and oxygen enrichment on channel performance. These studies have shown that MHD generator channels can be designed to operate efficiently over the range of 250 to 2135 thermal megawatts. The optimum design conditions for each of the thermal inputs were established by investigating various combinations of electrical load parameters, pressure ratios, magnetic field profiles, and channel lengths. These results provide design flexibility for the baseload combined cycle MHD/steam power plant. (Author)

A82-17923 # Localing schemes for a 50 MW/th/ diagonally connected MHD generator. C. C. P. Pian and A. M. Demirjian (Avco Everett Research Laboratory, Inc., Everett, MA). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0395. 8 p. Contract No. DE-AC01-80ET-15614.

The characteristics of diagonally connected subsonic MHD generators operating with and without current control/power shuffle circuits are investigated. The results of the analysis are presented for the 50 MW(th) CDIF 1B2 generator. It is shown that an axial current flows in the uncontrolled diagonal generator, which decreases the generator's performance. Electrode current control circuits can be used as power shufflers to eliminate the axial current and to improve the efficiency. The improved performance efficiency can be maintained to part-load conditions when the inverter, channel and combustor controls are integrated. Control requirements for generators with mid-channel power taps are also discussed. (Author)

A82-17841 ° # Impact of uniform electroda current distribution on ETF. D. J. Bents (NASA, Lewis Research Center, Cleveland, OH). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0423. 8 p. 5 refs.

A basic reason for the complexity and sheer volume of electrode consolidation hardware in the MHD ETF Powertrain system is the channel electrode current distribution, which is non-uniform. If the channel design is altered to provide uniform electrode current distribution, the amount of hardware required decreases considerably, but at the possible expense of degraded channel performance. This paper explains the design impacts on the ETF electrode consolidation network associated with uniform channel electrode current distribution, and presents the alternate consolidation designs which occur. They are compared to the baseline (non-uniform current) design with respect to performance, and hardware requirements. A rational basis is presented for comparing the requirements for the different designs and the savings that result from uniform current distribution. Performance and cost impacts upon the combined cycle plant are discussed. (Author)

A82-18124 International Symposium on Wave and Tidal Energy, 2nd, St. John's College, Cambridge, England, September 23-25, 1981, Proceedings. Symposium sponsored by the British Hydromechanics Research Association. Edited by H. S. Stephens and C. A. Stapleton (British Hydromechanics Research Association, Cranfield, Beds., England). Cranfield, Beds., England, BHRA Fluid Engineering, 1981, 447 p.

Topics discussed include wave power device interactions, the mathematical modeling of tidal power, and wave power with air turbines. Particular attention is given to the hydrodynamic characteristics of the Bristol Cylinder, the Strangford Lough tidal energy project, and the Foilpropeller for wave power propulsion. Consideration is also given to a submerged oscillating water column device, models of wave energy transformation near a coast, and the environmental implications of tidal power.

J.F.

A82-18201 Possible application of electromagnetic guns to impact fusion. R. N. Kostoff (U.S. Department of Energy, Washington, DC), A. T. Peaslee, Jr. (Los Alamos National Laboratory, Los

Alamos, NM), and F. L. Ribe (Washington, University, Seattle, WA). (U.S. Army Armaments Research and Development Command and Defense Advanced Research Projects Agency, Conference on Electromagnetic Guns and Launchers, San Diego, CA, Nov. 4-6, 1980.) IEEE Transactions on Magnetics, vol. MAG-18, Jan. 1982, p. 194-196. 21 refs. Research sponsored by the U.S. Department of Energy.

The possible application of electromagnetic guns to impact fusion for the generation of electric power is discussed, and advantages of impact fusion over the more conventional inertial confinement fusion concepts are examined. It is shown that impact fusion can achieve the necessary high yields, of the order of a few gigajoules, which are difficult to achieve with lasers except at unrealistically high target gains. The rail gun accelerator is well adapted to the delivery of some 10-100 megajoules of energy to the fusion target, and the electrical technology involved is relatively simple: inductive storage or rotating machinery and capacitors. It is concluded that the rail gun has the potential of developing into an impact fusion macroparticle accelerator.

A82-18220 # Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process. S. L. Ridgway, C. K. B. Lee, and R. P. Hammond (R & D Associates, Marina del Rey, CA). American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, 2nd, Colorado Springs, CO, Dec. 1-3, 1981, Paper 81-2596. 8 p. 9 refs. Research sponsored by the U.S. Department of Energy.

The Mist Flow Ocean Thermal Energy Process is a practical method for exploiting the ocean temperature difference without using heat exchangers or large vapor turbines. Warm ocean surface water is sprayed upward into the bottom of an evacuated vertical duct. Vapor flashes from the sprayed water droplets and drags them upward as it proceeds to the top of the duct. There the vapor is condensed by cold water obtained from the depths. The validity of the concept has been demonstrated in a set of experiments conducted in a 4-meter tall transparent test column of 23 x 36 cm cross section. The coupling between the vapor and the droplets remained strong as energy equivalent to over 60 meters of lift was transferred from the vapor to the water droplets. Power plant designs based on these experimental data imply costs of about \$1,200 per kilowatt for power plant sizes in the 10 MW range. Power plants operating with only 16 C temperature difference appear practical.

(Author)

A82-18328 # Performance of a small low speed Darrieus type rotor. G. Ahmadi (Shiraz University, Shiraz, Iran). Revue Roumaine des Sciences' Techniques, Série de Mécanique Appliquée, vol. 26, May-June 1981, p. 489-494. 15 refs. Research supported by Shiraz University.

A model for the performance of a small, low speed, high chordal ratio Darrieus is presented. A tip speed ratio below 1.5 was chosen. and experiments on a test machine with NACA 0012 blades with a 12 cm chord are reported. The wood blades were 32.5 cm long, vertically mounted, and spaced 33.6 cm apart, yielding the chord to diameter ratio of 0.7. The Darrieus was tested at varying speeds and pitch angles, and power coefficients were calculated. A 7.5 deg pitch angle was determined to be optimum for the model, with efficiency increasing with windspeed. The high chordal ratio resulted in low power coefficients being obtained, near 5 percent at 20 m/sec.

Design of a cell for electrode kinetic investiga-**AR2-18394** tions of fuel cell reactions. H. Olender, J. McBreen, W. E. O'Grady, S. Srinivasan (Brookhaven National Laboratory, Upton, NY), and K. V. Kordesch (Graz, Technische Universität, Graz, Austria). Electrochemical Society Journal, vol. 129, Jan. 1982, p. 135-137, 10 refs. Contract No. DE-AC02-76CH-00016.

Two designs of a cell for investigation of electrode kinetics of fuel cell reactions in acid media are described. The cells are suitable for evaluation of carbon supported platinum electrodes under conditions simulating a phosphoric acid fuel cell environment at elevated temperature and pressure. The usefulness of this for obtaining fuel cell performance, overpotential-current density relation, and in situ platinum surface area measurements in 98.6% H3PO4 at 150 C is demonstrated. The cell design is also ideal for the

electrochemical determination of cross migration of oxygen through the matrix at 180 C.

Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors. P. Becla and E. Placzek-Popko (Wroclaw, Politechnika, Wrocław, Poland). Infrared Physics, vol. 21, Nov. 1981, p. 323-332. 16 refs.

N82-10005 West Virginia Univ , Morgantown

AN INDOOR BLADE TEST FACILITY FOR DETERMINING THE BASIC AERODYNAMIC PROPERTIES OF DARRIEUS WIND TURBINE AIRFOILS WITH TEST RESULTS FOR AN NACA 0015 AND A MODIFIED SECTION Ph.D. Thesis Walter Paul Wolfe 1981 332 p

Avail Univ Microfilms Order No 8118421

An indoor facility was developed for use in the aerodynamic testing of Darrieus wind turbine blades. A three component strain gage balance was used to reduce lift, drag, and moment coefficients of blades whose angle of attack, chord to radius ratio and Reynolds number could be systematically varied A computer data acquisition system was developed to automatically record, reduce, and save the test data. It was learned that the unusual flow field of this test environment necessitates unique induced velocity corrections to the test data. Computer codes were developed to calculate the angles of attack induced at the blade by the trailing tip vortices. The results were then used to correct the test data. The effects of flow curvature on blade aerodynamics were experimentally verified. Both blades demonstrated virtual camber and incidence as evidenced by non-zero moment coefficients and angles of zero lift and minimum drag

N82-10406# General Electric Co., St. Petersburg, Fla. Gas Turbine Div

WATER-COOLED GAS TURBINE DEVELOPMENT PRO-**GRAM Final Report**

Jun 1981 249 p Sponsored in part by Electric Power Research Inst 2 Vol

(EPRI Proj 234-3)

(DE81-904245. EPRI-AP-1889-Vol-1) NTIS

HC A11/MF A01

Work on the EPRI water cooled gas turbine development program, RP234 is summarized. The viability of water cooling to achieve higher firing temperatures and increased fuels flexibility in utility gas turbines was established it is found that water cooling is a viable concept and that it results in considerable improvements in gas turbine combined cycle efficiency at increased firing temperatures

N82-10434# Sandia Labs , Albuquerque, N Mex RESIDUAL STRESSES IN DARRIEUS VERTICAL AXIS WIND TURBINE BLADES

P Veers Apr 1981 63 p (Contract DE-AC04-76DP-00789) SAND-81-0923) (DE81-1026144. HC A04/MF A01

NTIS Avail

A numerical package called RESID was essential to calculate the residual stresses in VAWT blades induced during cold forming Using a strength of materials - elementary beam theory approach, RESID models the material response with a bilinear stress-strain curve, and the cross sectional geometry with an array of area increments. Through an iterative solution procedure residual stresses are predicted for a specified final radius of curvature or applied bending moment. Results are compared to theoretical solutions for simple geometries and with MARC Finite element results for VAWT blade geometries Calculating residual stress levels, determining acceptable residual stress levels, and a method of reducing residual stresses are discussed. A complete listing and sample run are inclined in the appendexes

N82-10452# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Goettingen (West Germany)

CALCULATION OF NATURAL MODES OF VIBRATION FOR ROTOR BLADES BY THE FINITE ELEMENT METHOD

Fritz Kiessling and Dieter Ludwig Jan 1981 66 p refs In GERMAN, ENGLISH summary

(DFVLR-FB-81-07) Avail NTIS HC A04/MF A01, DFVLR. Cologne DM 14,20

The mass and stiffness matrices for a rotating blade are established by the finite element method. The formulation is

based on the Lagrange function presented for combined flapwise bending, chordwise bending, and torsion of twisted nonuniform rotor blades. The element matrices were created by the nonnumeric computer program REDUCE by which it is possible to evaluate the formulas by symbolic manipulation. An ordering scheme was introduced to demonstrate which terms were simplified or neglected As examples, eigenanalyses are performed for a nonrotating homogeneous beam and for the rotor blade of a wind energy converter Author (ESA)

N82-10492 Texas A&M Univ , College Station A COMPUTER MODEL OF A STIRLING ENGINE USING A TWO-PHASE TWO-COMPONENT WORKING FLUID Ph.D. Thesis

David Allen Renfroe 1981 193 p

Avail Univ Microfilms Order No 8118295

Stirling engines are potentially the most efficient converters of thermal energy to mechanical work that are manufacturable In addition to its high efficiency capability, it also operates relatively cleanly, quietly, and with multiple fuel capability. Its one deficiency is the low specific power (power output/engine size) A method of increasing specific power is described. This is by utilizing a two-phase two-component (TPTC) working fluid or one having a carrier gas and a component which changes phase during the cycle, such as a mixture of water and air in order to study the effect of adding water to the working fluid of a Stirling engine on its operation, a computer model of the system was developed The TPTC model is an extension of a Stirling engine with an ideal gas working fluid and includes provisions for accounting for differences in heat transfer and flow losses for a TPTC working Dissert Abstr

N82-10493 Virginia Univ , Charlottesville FUNDAMENTAL INVESTIGATIONS ON FUEL CELLS FOR TRANSPORTATION APPLICATIONS Ph.D. Thesis Earl Jennings Taylor 1981 268 p

Avail Univ Microfilms Order No 8117914

Three areas concerning fuel cells for transportation applications were investigated. The areas are (1) a comparison of oxygen. reduction in phosphoric acid and in trifluoromethanesulfonic acid, (TFMSA), (2) testing of three types of fuel cells under simulated vehicular operating conditions, and (3) the design, fabrication, and testing of a 1/2-kilowatt alkaline fuel cell module. Additions of TFMSA to phosphoric acid enhance the oxygen reduction in phosphoric acid It is shown that the single cell has no adverse effect on fuel cell performance in simulated automobile power requirements. It is demonstrated that the single cells can be scaled-up without loss of performance

N82-10494 Princeton Univ, N J THE PLASMADYNAMICS AND IONIZATION KINETICS OF THERMIONIC ENERGY CONVERSION Ph.D. Thesis John Langie Lawless, Jr. 1981 198 p.

Avail Univ Microfilms Order No 8118339 Radiation by a Cesium recombination laser operating in a different thermionic converter as an energy efficient process is discussed. To reduce the plasma arc drop, thermionic energy conversion was studied It is predicted that it is possible to generate the required laser light from a thermionic-type Cesium plasma. A numerical method is developed to solve the thermionic plasma dynamics. The effects of the complete system of electron atom inelastic collisions on the ionization recombination problem are reduced to a simple system one quantum approximation A Cesium recombination laser is predicted and the magnitudes for the population inversion and the laser efficiency are derived Thermionic converter performance using laser radiation is considered it is found that laser radiation impinging on a thermionic plasma enhances the ionization process thereby raising the plasma density and reducing the plasma arc drop

Dissert Abstr

N82-10495*# Gilbert/Commonwealth, Reading, Pa MAGNETOHYDRODYNAMICS MHD ENGINEERING TEST FACILITY ETF 200 MWE POWER PLANT. CONCEPTUAL DESIGN ENGINEERING REPORT CDER. VOLUME 3: **COSTS AND SCHEDULES Final Report**

Sep 1981 61 p 5 Vol

(Contracts DEN3-224, DE-AI01-77ET-10769)

(NASA-CR-165452-Vol-3, DOE/NASA/0224-1-Vol-3) NTIS HC A04/MF A01 CSCL 10B

The extimated plant capital cost for a coal fired 200 MWE electric generating plant with open cycle magnetohydrodynamics is divided into principal accounts based on Federal Energy Regulatory Commission account structure. Each principal account is defined and its estimated cost subdivided into identifiable and major equipment systems. The cost data sources for compiling the estimates, cost parameters, allotments, assumptions, and contingencies, are discussed. Uncertainties associated with developing the costs are quantified to show the confidence level acquired Guidelines established in preparing the estimated costs are included. Based on an overall milestone schedule related. to conventional power plant scheduling experience and starting procurement of MHD components during the preliminary design phase there is a 6 1/2-year construction period. The duration of the project from start to commercial operation is 79 months The engineering phase of the project is 4 1/2 years, the construction duration following the start of the man power block

N82-10524# Little (Arthur D), Inc., Cambridge, Mass LARGE WIND TURBINE GENERATOR PERFORMANCE ASSESSMENT, TECHNOLOGY STATUS REPORT NO. 3 Interim Report

W A Vachon Jul 1981 136 p refs Sponsored by Electric Power Research Inst

(EPRI Proj 1348-1)

(DE81-903763, EPRI-AP-1959) NTIS

HC A07/MF A01

Detailed summaries of test results are presented for the US Department of Energy's 200-kW MOD-OA horizontal-axis WTs that were interconnected with electric utilities at various locations around the United States A description of the progress and experiences with both the MOD-1 15-MW WT and the cluster of three MOD-2 25-MW WTs is also presented, along with a summary of plans for the DOE vertical-axis wind turbine program A brief summary of Danish large WT programs is also provided

N82-10536# Tata Energy Research Inst, Bombay (India) Documentation Center

WATER-PUMPING-WINDMILL DESIGNS: A HANDBOOK Tarangini Rastogi, comp and Narsing R Rao, comp Jun 1981 162 p refs

(DE81-904016, NP-1904016) Avail NTIS HC A08/MF A01 Windmills are becoming an attractive proposition for water pumping in the rural areas. Information on designs of water pumping windmills which could be constructed with inexpensive and locally available materials and skills is presented. This handbook covers about 23 indigeneous windmill designs and information such as name of the designer, institutional affiliation, type of windmill, specific applications and suitability, design features, and operating data wherever available. Most of these designs tested and were successfully used in different parts of the world Commercially obtainable windmills listed along with complete address of the manufacturers and relevant technical specifications TΜ

N82-10553# Argonne National Lab., III LIQUID-METAL MHD FOR SOLAR AND COAL

E S Pierson, D Cohen, and S J Grammel 1980 10 p refs Presented at the 7th Intern Conf on MHD Elect Power Generation, Cambridge, Mass., 16-20 Jun 1980 (Contract W-31-109-eng-38)

(DE81-023545. CONF-800617-8) NTIS Avail HC A02/MF A01

The two phase generator, liquid metal magnetohydrodynamic energy conversion system has an inherently thermodynamic efficiency for the same heat source and sink temperatures and is better suited for cogeneration than other conversion systems For solar applications, attractive efficiencies in comparison with alternative systems are calculated, and cogeneration advantages are indicated. For coal applications, recent coal combustion gas copper reaction results show that the copper can be used to control SO2 emissions DOE

N82-10559# Midwest Research Inst., Golden, Colo Solar Energy Research Inst

FABRICATION, TESTING, AND MODELING PLANS FOR A 125-KW COUNTER-ROTATING-TURBINE WAVE ENERGY CONVERTER

J Miles and T Penney Jun 1981 12 p refs Presented at the 8th Ocean Energy Conf., Washington, D.C., 7-11 Jun. 1981 (Contract EG-77-C-01-4042) (DE81-023946, SERI/TP-634/1215, CONF-810622-4) Avail

05 ENERGY CONVERSION

NTIS HC A02/MF A01

An air turbine accepting bi-directional flow and featuring counter-rotating turbine wheels is described. The turbine is for use with an oscillating water column and an air chamber to form a wave energy converter. Plans are presented for testing the turbine in a steady-state manner so as to obtain output torque and mass flow as functions of operational parameters Concurrent modeling studies are described which will lead to the design of an optimized airchamber

N82-10882# Massachusetts Inst. of Tech., Cambridge Energy Lab

KEY CONTRIBUTIONS IN MHD POWER GENERATION Quarterly Technical Progress Report, 1 Mar. - 31 May 1980 J F Louis May 1981 162 p refs (Contract DE-ACO1-79ET-15518)

(DF81-028121 DOE/ET-15518/5) HC A08/MF A01

NTIS Avail

Progress is reported in (1) investigating electrical behavior in the vicinity of electrode and insulating walls, (2) studying critical performance issues in the development of combustion disk generators (3) developing and testing electrode modules (including studies of insulator properties) (4) determining coal combustion kinetics and ash behavior relevant to two-stage MHD combustors, and (5) investigating the mixing and flow aerodynamics of a high swirl geometry second stage

N82-10888# TRW Defense and Space Systems Group, Redondo Beach, Calif Combustion and Power Technology Dept HIGH PRESSURE MHD COAL COMBUSTORS INVESTIGA TION, PHASE 2 Final Technical Report

H Iwata and R Hamberg May 1981 129 p (Contract DE-AC22-78ET-11053)

(DE81-027238, DOE/ET-11053/T1, FE-2706-43) Avail NTIS HC A07/MF A01

A high pressure MHD coal combustor was investigated. The purpose was to acquire basic design and support engineering data through systematic combustion experiments at the 10 and 20 thermal megawatt size and to design a 50 MW/sub t/

combustor This combustor is to produce an electrically conductive plasma generated by the direct combustion of pulverized coal with hot oxygen enriched vitiated air that is seeded with potassium carbonate. Vitiated air and oxygen are used as the oxidizer, however, preheated air will ultimately be used as the oxidizer in coal fired MHD combustors

N82-10936 City Univ of New York, N Y

THERMOELECTRIC CONVERSIONS BASED ON NOISE RECTIFICATION Ph.D. Thesis

Andrei Cernasov 1981 178 p Avail Univ Microfilms Order No 8119649

A complete analysis of the feasibility, operation, and performance of heat engines based on the rectification of thermal noise is presented. Both the close to thermodynamic equilibrium and 'far from thermodynamic equilibrium' cases are considered All standard thermodynamic results, including the Second Law, are found to hold for all cases. While high efficiencies and output power densities are possible, if normal exponential type diodes are used the small physical sizes of efficient fluctuation heat engines are beyond the capabilities of present technology However, no thermodynamics reasons for the weakly nonlinear character of practical diodes, like PN junctions, are found. Since high nonlinearity ca compensate for large system sizes, when highly nonlinear diodes are discovered, efficient fluctuation heat engines could become feasible Dissert Abstr

N82-10961# Los Alamos Scientific Lab , N Mex DESIGN CÖNSIDERATIONS FOR VEHICULAR FUEL CELL **POWER PLANTS**

D K Lynn, J B McCormick, R E Bobbett, S Srinivasan, and J R Huff 31 Mar 1981 14 p refs Presented at 16th Intersoc Energy Conversion Engr Conf., Atlanta, 9-14 Aug 1981

(Contract W-7405-eng-36)

(DE81-769737, LA-UR-81-1054, CONF-810812-7) Avail NTIS HC A02/MF A01

Designs in fuel cells as an efficient, nonpolluting vehicular power source that can operate on nonpetroleum fuel were investigated Phosphoric acid fuel cell power plant designs were studied to determine the performance level they would provide, both for a compact passenger vehicle and a 40 ft city bus. The fuel is steam reformed methanol. It is indicated that 1978 fuel

cell technology provides a 22 to 50% improvement in fuel economy over the 1980 EPA estimate for the conventionally powered General Motors X car A reasonable advanced in fuel cell technology improves performance and fuel consumption of both vehicles substantially DOF

N82-11044# Sandia Labs, Albuquerque N Mex Advanced **Energy Projects Div**

WIND RIPPLE ANALYSIS

R E Akins 1981 8 p refs (Contract DE-ACO4-76DP-00789)

(DE81-030129 DOE/DP-00789/T15) NTIS

HC A02/MF A01

Experimental techniques were developed which allow analysis of full scale performance of wind turbines with particular emphasis on the effects caused by turbulence in the incident wind. These techniques are presented, using data from the DOE/Sandia Vertical Axis Wind Turbine program Three techniques were developed for use in evaluating the fluctuating output of a wind turbine Techniques were sought which allowed accurate assessment of the wind ripple of the contributions to the fluctuation in turbine output caused by atmospheric turbulence. The advantages and disadvantages of these techniques are addressed

N82-11045# Washington Univ Technology Associates, Inc. St Louis, Mo

YAWING OF WIND TURBINES WITH BLADE CYCLIC PITCH VARIATION

K H Hohenemser A H P Swift, and D A Peters 1981 15 p

(Contract DE-AC02-77CH-00178, EG-77-C-01-4042)

(DE81-030091 SERI/TR-8085-3-T1) NTIS

HC A02/MF A01

A two-bladed wind rotor with passive cyclic pitch variation, yawed for the purpose of rotor speed and torque control was studied to determine the potential cost effectiveness of wind energy conversion. A simple mechanism adopted from rotorcraft technology for obtaining passive cyclic pitch variation makes rapid yaw rates possible without causing vibratory hub moments and without producing appreciable out-of-plane blade excursions. A 7.6 m diameter vane stabilized fully instrumented wind rotor having low blade solidity was operated 1980, during 41 days for 96 hours. The operational envelope extended to 16m/sec wind velocity to 45 degree yaw angle power on and 80 degree yaw angle power off The rotor was automatically yawed when 228 rpm at 10 kW rotor power was exceeded Reverse yawing was performed manually. Within the tested performance envelope, loads and vibrations were low. The rotor ran smoothly even at high yaw angles and at high yaw rates DOE

N82-11173# National Bureau of Standards, Washington, D.C. Chemical Stability and Corrosion Div

MASS SPECTROMETRIC STUDIES OF MHD SLAG THERMOCHEMISTRY Interim Report

J W Hastie and E R Plante Jun 1981 36 p refs (PB81-221434, NBSIR-81-2293) Avail NTIS HC A03/MF A01 CSCL 07D

The following potassium-containing systems were studied binary mixtures of K2O with SiO2 Al2O3, Fe2O3, and ZrO2. a series of more complex synthetic slags containing K2O, SiO2, CaO, MgO, Al2O3, and Fe2O3 and MHD channel slag (Illinois No 6 coal) and several slag-NaCl mixtures. Data were obtained over a sufficiently wide range of component-type, composition and temperature to reveal systematic trends in slag activities from which empirical predictions are possible. However, anomalous behavior was also noted, mainly in the form of nonequilibrium effects. Application of the vaporization and activity data to plasma-slag interaction and to the recovery of potassium seed from slag is also considered GRA

N82-11380# Cherrywood Farms, Williamsburg, Mich PROJECT DEMONSTRATION OF WIND-TURBINE ELEC-TRICITY: INTERCONNECTING A NORTHERN MICHIGAN PRUIT FARM WITH A MAJOR UTILITY Interim Report.

2 Sep. 1980 - 27 Apr. 1981

David M Amon 1981 86 p

(Contract DE-FG02-80R5-10226)

DOE/R5-10226/1) NTIS (DE81-030950. Avail

HC A05/MF A01

Progress is reviewed in a project to test the economic feasibility of wind turbine technology for generating electricity The use of wind genrated electricity on a commercial fruit farm

interconnecting a commercial fruit farm with a major utility to sell power are the find project goals DOE

N82-11399*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio HIGH THERMAL POWER DENSITY HEAT TRANSFER Patent

Application James F Morris, inventor (to NASA) Filed 30 Oct 1980

(NASA-Case-LEW-12950-1, US-Patent-Appl-SN-202228) Avail NTIS HC A02/MF A01 CSCL 20D

Heat from a high temperature heat pipe is transferred through a vacuum or a gap filled with electrically nonconducting gas to a cooler heat pipe. The heat pipe is used to cool the nuclear reactor while the heat pipe is connected thermally and electrically to a thermionic converter If the receiver requires greater thermal power density, geometries are used with larger heat pipe areas for transmitting and receiving energy than the area for conducting the heat to the thermionic converter. In this way the heat pipe capability for increasing thermal power densities compensates for the comparatively low thermal power densities through the electrically non-conducting gap between the two heat pipes

NASA

N82-11421# Little (Arthur D), Inc., Cambridge, Mass ASSESSMENT OF I.C. ENGINES AS DRIVERS FOR HEAT ACTUATED HEAT PUMPS

J C Burke, W P Teagan, and P G Goff 1981 6 p Presented at the DOE Heat Pump Contractors' Program Integration Meeting, McLean, Va , 2-4 Jun 1981 Prepared for ORNL (Contract W-7405-eng-26)

CONF-810672-11) NTIS (DE81-024086. HC A02/MF A01

The present suitability and future potential of gas-fired and oil-fired internal combustion (IC) engines for use in heat-actuated heat pumps for space conditioning applications are assessed Drives for residential and light commercial machines up to 100 KW output or approximately 50 HP engine input are considered. A conceptual design identifying major generic elements was prepared to serve as a basis for estimating performance maintenance costs. A review of prior experiences with IC engines with heat pumps used in similar situations was conducted. Capital costs and maintenance costs were estimated and diesel and spark ignition engine efficiencies were determined Institutional and operational considerations were identified

N82-11478# AiResearch Mfg Co., Torrance, Calif BRAYTON/RANKINE 10-TON GAS-FIRED SPACE CONDI-TIONING SYSTEM, PHASE 2 Annual Report

16 Mar 1981 103 p refs (Contracts GRI-5014-341-0114, W-7405-eng-26)

(PB81-223372, GRI-80/0053, ATR-1) HC A06/MF A01 CSCL 13I NTIS

The heat-actuated space conditioning system provides moe efficient use of natural gas and is intended as an all-gas alternative to the electric heat pump. The system employs a subatmospheric natural-gas-fired heat pump A centrifugal R-12 refrigerant compressor is driven directly from the Brayton engine rotating group through a hermetically sealed coupling Unique features that offer high life-cycle performance include a permanent magnet coupling, foil bearings, and atmospheric in-line combustor, and a high-temperature recuperator. Predicted overall engine efficiency is 27 percent and predicted overall coefficient of performane (COP) at the energy source is 10 in cooling and 12 to 14 in heating GRA

N82-11585# Brown Univ , Providence, R I ANALYSIS OF THERMAL/MECHANICAL

CONVERSION CONCEPTS Final Report

R DiPippo, J Kestin, and P F Maeder Jun 1981 15 p refs (Contract DE-AS02-76ET-28320)

(DE81-027854. DOE/ET-28320/48) NTIS Avail HC A02/MF A01

A list of project activities, meetings, and publications is presented DOE

N82-11907# Oak Ridge National Lab , Tenn ENGINEERING CHALLENGES OF FUSION-REACTOR DEVELOPMENT

Jan B Talbot 1981 10 p refs Presented at the Soc of Women Eng 1981 Nati Conv., Anaheim, Calif., 24-28 Jun 1981

(Contract W-7405-eng-26)

(DE81-024129. CONF-810699-1) NTIS

HC A02/MF A01

A brief review of the fusion research program and some problems to be faced in the near future and described DOE

N82-11934# Mississippi State Univ. Mississippi State Center

MAGNETOHYDRODYNAMIC RESEARCH PROGRAM OF THE MHD ENERGY CENTER AT MISSISSIPPI STATE UNIVERSITY AND STRUCTURAL FEATURES OF MHD RADIANT BOILERS

W S Shepard 1981 53 p Lectures presented to MHD/HRSR Sci and Engr of the Peoples Republic of China, 10-31 Jul

(Contract DE-AC02-80ET-15601)

(DE81-029901, DOE/ET-15601/T3, TR-3) Avail NTIS HC A04/MF A01

Magnetohydrodynamic is conducted largely through use of test stand which simulates conditions in the MHD gas stream Continual modification of the test stand to reflect experimental results produced a test stand capable of test runs of 100 hours. runs of more than 500 hours are planned. The test stand is described, and experimental results are discussed. The design and construction of MHD radiant boiler are described. The radiant furnance serves several functions in a heat recovery and seed recovery system, it cools flue gases to a temperature suitable for entrance to the secondary superheater, it generates steam, it provides for the removal of molten ash at high temperatures, and it provides access for intrusive and nonintrusive instrumentation to the gas-side environment DOE

N82-11935# Massachusetts Inst of Tech , Cambridge Plasmas Fusion Center

RF-DRIVEN TOKAMAK REACTOR WITH SUB-IGNITED. THERMALLY STABLE OPERATION

M M Shoucri, (IREQ, Varennes, Canada), and M M Shoucri, (IREQ, Varennes, Canada) Feb 1981 9 p refs Presented at the 4th Topical Conf on RF Heating of Plasma, Austin, Tex., Feb. 1981

(Contract DE-AC02-76ET-51013)

(DE81-029437, DOE/ET-51013/8, PFC/RR-81-6) Avail NTIS HC A02/MF A01

A Radio-Frequency Driven Tokamak Reactor (RFDTR) can use RF-Power, programmed by a delayed temperature measurement, to thermally stabilize a power equilibrium below ignition, and to drive a steady state current. We propose the parameters for such a device generating approx = 1600 MW thermal power and operating with Q approx = 40 (= power out/power in) A one temperature zero-dimensional model allows simple analytical formulation of the problem. The relevance of injected impurities for locating the equilibrium is discussed. We present the results of a one-dimensional (radial) code which includes the deposition of the supplementary power, and compare with out zerodimensional model DOF

N82-11944# Los Alamos Scientific Lab , N Mex UNCERTAINTIES ASSOCIATED WITH INERTIAL-FUSION IGNITION

Gene H McCall 1981 10 p refs Presented at the Conf on Optics, Santa Fe, N Mex , Apr 1981 (Contract W-7405-eng-36)

(DE81-025408, LA-UR-81-1750, CONF-81-429-34) Avail NTIS HC A02/MF A01

An estimate is made of a worst case driving energy which is derived from analytic and computer calculations. The uncertainty can be reduced by a factor of 10 to 100 if certain physical effects are understood. That is not to say that the energy requirement can necessarily be reduced below that of the worst case, but it is possible to reduce the uncertainty associated with ignition energy With laser costs in the \$0.5 to 1 billion per MJ range, it can be seen that such an exercise is worth-

N82-11947# Westinghouse Electric Corp., Pittsburgh, Pa Research and Development Center

DEVELOPMENT, TESTING, AND EVALUATION OF MHD MATERIALS AND COMPONENT DESIGNS. VOLUME 1. EXECUTIVE SUMMARY Final Report, 15 Oct. 1973 - 31 Dec. 1975

W E Young Nov 1980 44 p refs (Contract DE-AC01-76ET-10805)

(DE81-026203, DOE/ET-10805/T1-Vol-1, FE-1540-29-Vol-1) Avail NTIS HC A03/MF A01

Results of studies on gas electrical properties, coal combustion, and MHD materials intended to support the Waltz Mill channel experiments are presented Materials testing indicated that stabilized zirconia should be an acceptable electrode material Cyclone coal combustors were studied and designs developed for a Waltz Mill size unit and a 25,000 lb/h prototype. The Waltz Mill facility performed in a highly satisfactory manner. Six non generating and 16 load tests were made on three channels Following a failure of the air heater tests were run essentially on materials and structure. The system was dismantled and reconstruction started to enable testing at the proposed Component Development Integrated Facility. A very successful 127-hour run was made on a pair of US designed and constructed MHD electrode modules in the Soviet Union's U-02 facility.

N82-11993*# Rasor Associates, Inc., Sunnyvale, Calif JET IMPINGEMENT HEAT TRANSFER ENHANCEMENT FOR THE GPU-3 STIRLING ENGINE

Douglas C Johnson, Craig W Congdon, Lester L Begg, Edward J Britt, and Lanny G Thieme Oct 1981 28 p refs (NASA-TM-82727, DOE/NASA/51040/33) Avail NTIS HC A03/MF A01 CSCL 13F

A computer model of the combustion-gas-side heat transfer was developed to predict the effects of a jet impingement system and the possible range of improvements available. Using low temperature (315 C (600 F)) pretest data in an updated model, a high temperature silicon carbide jet impingement heat transfer system was designed and fabricated. The system model predicted that at the theoretical maximum limit, jet impingement enhanced heat transfer can (1) reduce the flame temperature by 275 C (500 F), (2) reduce the exhaust temperature by 110 C (200 F). and (3) increase the overall heat into the working fluid by 10%, all for an increase in required pumping power of less than 0.5% of the engine power output Initial tests on the GPU-3 Stirling engine at NASA-Lewis demonstrated that the jet impingement system increased the engine output power and efficiency by 5% - 8% with no measurable increase in pumping power. The overall heat transfer coefficient was increased by 65% for the maximum power point of the tests

N82-12444*# Chrysler Corp , Detroit, Mich

AGT-102 AUTOMOTIVE GAS TURBINE Summary Report
Jun 1981 434 p refs Sponsored by NASA Lewis Research
Center Prepared jointly with Williams Research Corp., Walled
Lake, Mich

(Contract DE-AC02-76CS-52749)

(NASA-CR-165353, DOE/NASA/2749-81/1) Avail NTIS HC A19/MF A01 CSCL 13I

Development of a gas turbine powertrain with a 30% fuel economy improvement over a comparable S1 reciprocating engine, operation within 041 HC, 34 CO, and 040 NOx grams per mile emissions levels, and ability to use a variety of alternate fuels is summarized. The powertrain concept consists of a single-shaft engine with a ceramic inner shell for containment of hot gasses and support of twin regenerators. It uses a fixed-geometry, lean, premixed, prevaporized combustor, and a ceramic radial turbine rotor supported by an air-lubricated journal bearing. The engine is coupled to the vehicle through a widerange continuously variable transmission, which utilizes gearing and a variable-ratio metal compression belt. A response assist flywheel is used to achieve acceptable levels of engine response. The package offers a 100 lb weight advantage in a Chrysler KilCar front-wheel-drive installation Initial layout studies, preliminary transient thermal analysis, ceramic inner housing structural analysis, and detailed performance analysis were carried out for the basic engine

N82-12446*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

MAGNETOHYDRODYNAMICS (MHD) ENGINEERING TEST FACILITY (ETF) 200 MWe POWER PLANT. DESIGN REQUIREMENTS DOCUMENT (DRD) Final Report

H S Rigo, R W Bercaw, J A Burkhart, T S Mroz, D J Bents, and A M Hatch (MIT) Sep 1981 88 p refs Revised (Contract DE-Al01-77ET-10769)

(NASA-TM-82705, DOE/NASA/10769-20-Rev-3) Avail NTIS HC A05/MF A01 CSCL 10B

A description and the design requirements for the 200 MWe (nominal) net output MHD Engineering Test Facility (ETF)

Conceptual Design, are presented. Performance requirements for the plant are identified and process conditions are indicated at interface stations between the major systems comprising the plant Also included are the description, functions, interfaces and requirements for each of these major systems. The lastest information (1980-1981) from the MHD technology program are integrated with elements of a conventional steam electric power generating plant.

N82-12537# Aeronautical Research Inst of Sweden, Stockholm A TWO-DIMENSIONAL STUDY OF THE MAXIMUM POWER THAT CAN BE OBTAINED FROM A WIND TURBINE IN A WIND SHEAR LAYER

Bo C A Johansson Apr 1981 60 p refs (FFA-134) Avail NTIS HC A04/MF A01

A two dimensional study, where the undisturbed velocity field is given and allowed to vary arbitrarily vertically, and the location of the wind turbine is given, is presented. The maximum power is calculated by the method of calculus of variations. The maximum power of common wind velocity profiles is only slightly larger than the power, which is obtained by a constant relative wind speed retardation, while for a linear velocity profile there is a considerable difference.

N82-12570*# Gilbert/Commonwealth, Reading, Pa MAGNETOHYDRODYNAMICS (MHD) ENGINEERING TEST FACILITY (ETF) 200 MWe POWER PLANT. CONCEPTUAL DESIGN ENGINEERING REPORT (CDER). VOLUME 1: EXECUTIVE SUMMARY Final Report

Sep 1981 48 p

(Contracts DEN3-224, DE-AI01-77ET-10769)

(NASA-CR-165452-Vol-1, DOE/NASA-0224/1-Vol-1) Avail NTIS HC A03/MF A01 CSCL 10B

Main elements of the design are identified and explained, and the rationale behind them was reviewed Major systems and plant facilities are listed and discussed Construction cost and schedule estimates are presented, and the engineering issues that should be reexamined are identified. The latest (1980-1981) information from the MHD technology program is integrated with the elements of a conventional steam power electric generating plant.

N82-12572*# United Technologies Corp., South Windsor, Conn. Power Systems Div.

LOW NO SUB X HEAVY FUEL COMBUSTOR CONCEPT PROGRAM Final Report, 23 Oct. 1979 - Jul. 1981

Paul Russell, George Beal, and Bruce Hinton 15 Oct 1981 99 p refs Prepared in cooperation with Pratt and Whitney Aircraft East Hartford, Conn

(Contracts DEN3-149, DE-AI01-77ET-13111)

(NASA-CR-165512, DOE/NASA/0149-1, QTR-3236) Avail NTIS HC A05/MF A01 CSCL 10B

A gas turbine technology program to improve and optimize the staged rich lean low NOx combustor concept is described Subscale combustor tests to develop the design information for optimization of the fuel preparation, rich burn, quick air quench, and lean burn steps of the combustion process were run. The program provides information for the design of high pressure full scale gas turbine combustors capable of providing environmentally clean combustion of minimally of minimally porcessed and synthetic fuels. It is concluded that liquid fuel atomization and mixing, rich zone stoichiometry, rich zone liner cooling, rich zone residence time, and quench zone stoichiometry are important considerations in the design and scale up of the rich lean combustor.

EAK

N82-12590# Purdue Univ , Lafayette, Ind School of Electrical Engineering ,

SECURITY ASSESSMENT OF POWER SYSTEMS INCLUDING ENERGY STORAGE AND WITH THE INTEGRATION OF WIND ENERGY Progress Report, 1 Apr. - 30 Jun. 1981

D P Carroll and P C Krause Jul 1981 17 p (Contracts DE-AS02-77ET-29100, EC-77-S-02-4206) (DE81-030166, DOE/ET-29100/T1) Avail, NT HC A02/MF A01

Methods of Resynchronizing wind turbine generators, and performance of wind turbines in a turbulent atmosphere, were discussed. The work on reduced order modeling by SEPI is reported Aggregation techniques which have been formulated are validated.

N82-12591# Sandia Labs , Albuquerque, N Mex Advanced Energy Project Div

VERTICAL-AXIS WIND-TURBINE CONTROL STRATEGY

Gerald M McNerney Aug 1981 21 p refs (Contract DE-AC04-76DP-00789)

SAND-81-1156) (DE81-031932,

NTIS Avail.

HC A02/MF A01

Early expense in automatic operation of the Sandia 17-m vertical axis research wind turbine (VAWT) demonstrated the need for a systematic study of control algorithms. To this end, a computer model was developed that uses actual wind time series and turbine performance data to calculate the power produced by the Sandia 17-m VAWT operating in automatic control. The model was used to investigate the influence of starting algorithms on annual energy production. The results indicate that, depending on turbine and local wind characteristics, a bad choice of a control' algorithm can significantly reduce overall energy production The model can be used to select control algorithms and threshold parameters that maximize long-term energy production

N82-12592# COECORP, Mountain View, Calif

INVESTIGATION AND RESEARCH OF SPECIFIC COMBUS-TION-TURBINE AND COMBINED-CYCLE FIELD PROBLEMS Annual Report

Aug 1981 62 p Prepared in cooperation with Aptech Engineering Services, Inc. Sponsored by Electric Power Research

(EPRI Proj 1802)

(DE81-904231, EPRI-AP-1981)

HC A04/MF A01

Specific combustion turbine and combined cycle field problems are discussed. These are (1) fuel filter plugging, (2) apparent compressor surge, (3) oily waste water, (4) compressor wheel failure, and (5) combuator problems. Results of research efforts are outlined

N82-12634# Edgerton, Germeshausen and Grier, Inc., Idaho Falls, Idaho

INNOVATIVE EQUIPMENT FOR SMALL-SCALE HYDRO **DEVELOPMENTS**

J D Lawrence and Leslie Pereira 1981 17 p refs Presented at the Waterpower Conf. Washington, D.C., 22 Jun 1981 Prepared in cooperation with Acres American, Inc., Buffalo, NY (Contract DE-AC07-76ID-01570)

(DE81-027820, EGG-M-03381, CONF-8106137-4) Avail

NTIS HC A02/MF A01

The feasibility of using off the shelf pumps as turbines, with induction motors as generators, and combinations of available equipment such as speed increasers, inlet valves, and gates for typical small scale hydro installations are discussed A computer simulation model was developed in the study which provides a basis to estimate the performance of pumps in the turbine mode of operation. It is indicated that a major part of the small hydro plant potential can be economically covered by the use of pumps as turbines and induction motors as generators especially for the smaller ratings

N82-12648# Joint Publications Research Service, Arlington,

GERMAN-ARGENTINE EXPERIMENT: VERTICAL-ROTOR WIND ENGINE

Peter Raabe In its W Europe Rept Sci and Technol, No 72 (JPRS-78876) 1 Sep 1981 p 18-19 Transl into ENGLISH from Tagesspiegel (Berlin), 4 Jul 1981 p 12

Avail NTIS HC A03/MF A01

Designed by aerodynamists, a wind motor built in Patagonia, is independent of the direction of the wind due to its vertical rotating axis. The narrow rotor blades have optimum aerodynamic efficiency Drum-like wind collectors at the top and bottom of the rotating axis serve as starters. The plant incorporates simple instead of sophisticated mechanical parts, and its maintenance requirements are extremely low. Only the two rotating bearings located at the top and bottom of the axis require lubrication, with the oil being changed only twice a year

N82-12943*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio

END REGION AND CURRENT CONSOLIDATION EFFECTS UPON THE PERFORMANCE OF AN MHD CHANNEL FOR THE ETF CONCEPTUAL DESIGN

S Y Wang and J Marlin Smith [1981] 9 p refs To be presented at the 20th Aerospace Sci Conf., Orlando, Fla. 11-14 Jan 1982, sponsored by AIAA (Contract DE-AI01-77ET-10769)

(NASA-TM-82744, DOE/NASA/10769-22, E-1057) Avail NTIS HC A02/MF A01 CSCL 201 The effects of MHD channel end regions on the overall

power generation were considered. The peak plant thermodynamic efficiency was found to be slightly lower than for the active region (41%) The channel operating point for the peak efficiency was shifted to the supersonic mode (Mach No., M sub c approx 1 1) rather than the previous subsonic operation (M sub c approx 09) The sensitivity of the channel performance to the B-field, diffuser recovery coefficient, channel load parameter, Mach number, and combustor pressure is also discussed in addition, methods for operating the channel in a constant-current mode are investigated. This mode is highly desirable from the standpoint of simplifying the current and voltage consolidation for the inverter system This simplification could result in significant savings in the cost of the equipment. The initial results indicate that this simplification is possible, even under a strict Hall field constraint. with resonable plant thermodynamic efficiency (40 5%)

N82-13013*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

TEST RESULTS AND FACILITY DESCRIPTION FOR A 40-KILOWATT STIRLING ENGINE Final Report

Gary G Kelm, James E Cairelli, and Robert J Walter Jun 1981 47 p refs (Contract DE-Ai01-77CS-51040)

(NASA-TM-82620, DOE/NASA/51040-27, E-871) Avail. NTIS HC A03/MF A01 CSCL 10B

A 40 kilowatt Stirling engine, its test support facilities, and the experimental procedures used for these tests are described Operating experience with the engine is discussed, and some initial test results are presented

N82-13114*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

THE EFFECT OF ROTOR BLADE THICKNESS AND SURFACE FINISH ON THE PERFORMANCE OF A SMALL AXIAL FLOW TURBINE

Richard J Roelke and Jeffrey E Haas 1982 13 p refs Proposed for presentation at the Gas Turbine Ann Meeting, London, 18-22 Apr 1982, sponsored by ASME Prepared in cooperation with Army Aviation Research and Development Command, Cleveland

(Contract DE-AI01-77CS-51040)

(NASA-TM-82726, DOE/NASA/51040-34, TR-81-C-29) Avail NTIS HC A02/MF A01 CSCL 21E

An experimental investigation was conducted to determine the effect of blade profile inaccuracies and surface finish on the aerodynamic performance of a 1113 cm tip diameter turbine The as-received cast rotor blades had a significantly thicker profile than the design intent and a fairly rough surface finish. Stage test results showed an increase of one point in efficieny by smoothing the surface finish and another three points by thinning the blade profiles to near the design profile. Most of the performance gain between the as-cast thick and the thinned rotor blades both with the same surface finish, was attributed to reduced trailing edge losses of the recontoured blades Author

N82-13367# Tennessee Univ Space Inst., Tullahoma Energy Conversion Div

TWO-DIMENSIONAL EFFECTS IN POWER TAKE-OFF

NTIS

M Isnikawa and Y C L Wu May 1981 29 p rets

(Contract DE-AC02-79ET-10815)

(DE82-000091. DOE/ET-10815/55)

HC A03/MF A01

A two-dimensional analytical model of the power take-off (PTO) region of a diagonal conducting wall MHD generator is presented and compared with experimental results. Reasonable agreement was found in both voltage and current distributions from the two-dimensional analysis, while similar comparison of experimental data with one-dimensional calculations with experiments was not satisfactory Power take-off from mid-channel was also investigated. It was found that larger current was carried by these electrodes. In addition, large-circulating current was found in the sidewalls resulting from diagonalization. Therefore ballast resistors are required to equalize the current. A general PTO resistor design was proposed Trade-off considerations

between power output and protection of over-current were made DOE

N82-13386*# Jet Propulsion Lab., California Inst. of Tech., Pasadena

EXPERIMENTAL AND ANALYTICAL INVESTIGATION OF A FLUIDIC POWER GENERATOR

V Sarohia, L Bernal, and R B Beauchamp 15 Nov 1981 81 p refs

(Contract NAS7-100)

(JPL-Pub-81-100) Avail NTIS HC A05/MF A01 CSCL 20D

A combined experimental and analytical investigation was performed to understand the various fluid processes associated with the conversion of flow energy into electric power in a fluidic generator Experiments were performed under flightsimulated laboratory conditions and results were compared with those obtained in the free-flight conditions. It is concluded that the mean mass flow critically controlled the output of the fluidic generator Cross-correlation of the outputs of transducer data indicate the presence of a standing wave in the tube, the mechanism of oscillation is an acoustic resonance tube phenomenon A linearized model was constructed coupling the flow behavior of the jet, the jet-layer, the tube, the cavity, and the holes of the fluidic generator. The analytical results also show that the mode of the fluidic power generator is an acoustical resonance phenomenon with the frequency of operation given by f approx = a/4L, where f is the frequency of jet swallowing. a is the average speed of sound in the tube, and L is the length of the tube Analytical results further indicated that oscillations in the fluidic generator are always damped and consequently there is a forcing of the system in operation

MDK

N82-13451# California Univ Los Angeles School of Engineering and Applied Science

ASYMMETRIC STRESS AND FAILURE ANALYSIS

J Yu and R Westmann [1981] 6 p refs (Contract DE-AT03-76SF-74016)

(DE81-026842. DOE/SF-74016/T3)

HC A02/MF A01

Avail NTIS

The cladding failure due to asymmetric structural response of the fuel cell is studied. The fracture and cracking patterns prior to the development of fuel-cladding contact and the forces in the cladding after fuel-cladding contact has been made are investigated.

N82-13490*# Engelhard Industries, Inc. Edison, NJ
DEVELOP AND TEST FUEL CELL POWERED ON-SITE
INTEGRATED TOTAL ENERGY SYSTEM. PHASE 3:
FULL-SCALE POWER PLANT DEVELOPMENT Quarterly

Report, Feb. - Apr. 1981 A Kaufman 24 Jun 1981 50 p

(Contract DEN3-241)

(NASA-CR-165328, DOE/NASA/0241-1, QR-1) Avail NTIS HC A03/MF A01 CSCL 10R

An integrated 5 kW power system based upon methanol fuel and a phosphoric acid fuel cell operating at about 473 K is described. Description includes test results of advanced fuel cell catalysts. a semiautomatic acid replenishment system and a completed 5 kW methanol/system reformer. The results of a preliminary system test on a reformer/stack/inverter combination are reported. An initial design for a 25 kW stack is presented Experimental plans are outlined for data acquisition necessary for design of a 50 kW methanol/steam reformer. Activities related to complete mathematical modelling of the integrated power system, including wasteheat utilization, are described.

N82-13507* Case Western Reserve Univ, Cleveland, Ohio.
TRANSIENT CATALYTIC COMBUSTOR MODEL Final
Report

James S Tien May 1981 87 p refs (Grant NsG-3230, Contract DE-AI01-77CS-51040) (NASA-CR-165324, DOE/NASA/3230-1) Avail. NTIS HC A05/MF A01 CSCL 10B

A quasi-steady gas phase and thermally thin substrate model is used to analyze the transient behavior of catalytic monolith combustors in fuel lean operation. The combustor response delay is due to the substrate thermal ineria. Fast response is favored by thin substrate, short catalytic bed length, high combustor inlet and final temperatures, and small gas channel diameters. The calculated gas and substrate temperature time history at different axial positions provides an understanding of how the

catalytic combustor responds to an upstream condition change. The computed results also suggest that the gas residence times in the catalytic bed in the after bed space are correlatable with the nondimensional combustor response time. The model also performs steady state combustion calculations; and the computed steady state emission characteristics show agreement with available experimental data in the range of parameters covered. A catalytic combustor design for automotive gas turbine engine which has reasonably fast response (< 1 second) and can satisfy the emission goals in an acceptable total combustor length is possible.

N82-13510°# Acurex Corp., Mountain View, Calif Energy and Environmental Div.

DEVELOPMENT OF A HIGH-TEMPERATURE DURABLE CATALYST FOR USE IN CATALYTIC COMBUSTORS FOR ADVANCED AUTOMOTIVE GAS TURBINE ENGINES Final Report

H Tong, G C Snow, E. K Chu, R L. S Chang, M J Angwin, and S L. Pessagno Sep 1981 169 p refs (Contracts DEN3-83, DE-AI01-77CS-51040)

(NASA-CR-165396, DOE/NASA/0083-1) Avail. NTI: HC A08/MF A01 CSCL 10B

Durable catalytic reactors for advanced gas turbine engines were developed. Objectives were, to evaluate furnace aging as a cost effective catalytic reactor screening test, measure reactor degradation as a function of furnace aging, demonstrate 1,000 hours of combustion durability, and define a catalytic reactor system with a high probability of successful integration into an automotive gas turbine engine. Fourteen different catalytic reactor concepts were evaluated, leading to the selection of one for a durability combustion test with diesel fuel for combustion conditions Eight additional catalytic reactors were evaluated and one of these was successfully combustion tested on propane fuel. This durability reactor used graded cell honeycombs and a combination of noble metal and metal oxide catalysts. The reactor was catalytically active and structurally sound at the end of the durability test EAK

N82-13515# Electric Power Research Inst. Palo Alto, Calif Steam Generator Project Office

WORKSHOP PROCEEDINGS: U-BEND TUBE CRACKING IN STEAM GENERATORS

Carl E Shoemaker, ed Jun. 1981 343 p refs Workshop held at Denver, 20-21 Aug. 1980

(DE81-903765; EPRI-WS-80-136; CONF-8008122) Avail. NTIS HC A15/MF A01

A design to reduce the rate of tube failure in high pressure feedwater heaters, a number of failed drawn and stress relieved Monel 400 U-bend tubes removed from three high pressure feedwater heaters was examined. Steam extracted from the turbine is used to preheat the boiler feedwater in fossil fuel fired steam plants to improve thermal efficiency. This is accomplished in a series of heaters between the condenser hot well and the boiler. The heaters closest to the boiler handle water at high pressure and temperature. Because of the severe service conditions, high pressure feedwater heaters are frequently tubed with drawn and stress relieved Monel 400.

N82-13519# Oregon State Univ , Corvatlis Dept of Atmospheric Science

WIND POWER: RESEARCH ON NETWORK WIND POWER OVER THE PACIFIC NORTHWEST. EXECUTIVE SUMMARY Progress Report, Oct. 1979 - Sep. 1980

R W Baker and E W Hewson Oct 1980 23 p refs (DE81-029360, DOE/BP-58) Avail, NTIS HC A02/MF A01

The research in FY-80 is composed of six primary tasks. These tasks include data collection and analysis, wind flow studies around an operational wind turbine generator (WTG), kite anemometer calibration, wind flow analysis and prediction, the Klickitat County small wind energy conversion system (SWECS) program, and network wind power analysis The data collection and analysis task consists of four sections, three of which deal with wind flow site surveys and the fourth with collecting and analyzing wind data from existing data stations

N82-13526# South Carolina Energy Research Inst, Columbia RESIDUAL-ENERGY-APPLICATION PROGRAM: EAST FACILITY REQUIREMENTS DOCUMENT, VOLUME 1 P W Yngve, F H Zander, and F J McCrosson 31 Jul 1981 85 p refs

(Contract DE-AC09-77ET-12866) DOE/ET-12866/8-Vol-1) (DE81-027536, HC <u>A</u>05/MF A01 (DE81-027536. Avail NTIS

The objectives of the EAST Facility are to perform research and development on heat energy recovery and conversion equipment, establish high confidence in system performance, system availability, and system operating, maintenance, and material costs, and provide a national competence in technologies required for the installation and operation of heat recovery systems. An initial testing capability recommended for EAST is presented and design specifications are provided for the physical plant and major test support systems. Five options are included for tailoring the full-up testing capability to reduce costs of the core facility T M

N82-13550 Stanford Univ., Calif. ELECTRICAL EFFECTS OF SLAG IN A DIFFUSE MODE MAGNETOHYDRODYNAMIC GENERATOR Ph.D. Thesis Ron Michael Nelson 1981 181 p Avail Univ. Microfilms Order No 8124118

A high temperature (1900 K) platinum-rhodium capped magnesia electrode was developed and successfully tested in a stagging MHD generator Diffuse mode (non-arcing) operation of high temperature anodes was achieved at current densities up to 3 amps sq cm2. The problem of cathode shorting caused by the ionic nature of slag electrical conductivity (with iron as the major mobile species) was not substantially alleviated by high temperature operation A computer code was developed which solves the governing electrical equations along with slag energy and thickness equations for a two dimensional, periodic electrode pair in a slagging MHD generator. The numerical results compare favorably with the experimental results including cases with shorted cathode walls. The computer model was used to assess the effects of slag and other operating parameters on Dissert Abstr generator performance

N82-13926# Mississippi State Univ., Mississippi State MHD

TESTING AND EVALUATION OF MHD MATERIALS AND SUBSTRUCTURES Final Technical Report, Apr. 1976 - Jun.

Jun 1981 204 p refs (Contract DE-AC01-78ET-10785) (DE81-024331, DOE/ET-10785/T1) NTIS Avail HC A10/MF A01

Stand that can simulate the environment in any of the various substructures of a coal fired baseline MHD power plant. After construction was completed, shakedown tests were performed, and the Test Stand was used in a series of tests to simulate the gas stream composition and temperature conditions in the baseline plant's radiant boiler. The tests were conducted in order to study the effect of stoichiometry and staged combustion on the generation of nitrogen oxide A computer based monitoring and control system was developed that provides safe Test Stand operation, controls the critical parameters, and accurately measures, displays, and logs the necessary physical data Several computer programs were developed to determine the thermal performance of the Test Stand, and several models were developed to predict the thermal performance of the Test Stand with bare walls and with slag coated walls, and to determine the gas stream properties as a function of temperature and pressure. DOF

N82-13983# Galaxy, Inc., Washington, D.C.
UPDATE ON SPECIFIED EUROPEAN R AND D EFFORTS.

PART 1: APPENDICES
Oct. 1980 117 p Partly in ENGLISH, partly in GERMAN (Contract DE-AC03-79SF-10538)
(DEB1-026404, DOE/SF-10538/T10) Avail

NTIS HC A06/MF A01

Progress and updata on specified European R and D are reported. The following topics are discussed blueburner test with different swirl spray nozzles, aerodynamics of a flat nonswirl blue flame, and large industrial blue flame burners, manufacturer's design and performance literature for the 2500 to 3500 KW KG5 gas turbine, the Kongsberg 1500 to 2000 kVA generating set, the 500 to 700 kVA generating set, the KG 831 gas turbine generating set, the KG 2 gas turbine, and selection criteria for gas turbines for emergency power supplies, and high temperature corrosion and carburization and silicon coatings as high temperature corrosion protection for gas turbine blades

N82-14520# Massachusetts Inst. of Tech., Cambridge National

CONCEPTUAL DESIGN OF SUPERCONDUCTING MAGNET SYSTEM FOR MAGNETOHYDRODYNAMIC (MHD) ENGI-NEERING TEST FACILITY (ETF) 200 MWe POWER PLANT Final Report

Nov 1981 259 p refs

(Grant NAG3-100)

(NASA-CR-165053, FBNML-NAS-E-2) NTIS HC A12/MF A01 CSCL 14B

A super conducting magnet system conceptual design to meet the requirements of a magnetohydrodynamic test facility power train is presented A detailed description of the magnet is accompanied by numerous engineering drawings. Functional requirements, system interfaces, and design criteria are reviewed System limits, safety precautions, operational procedures, and maintenance procedures are discussed

N82-14633*# National Aeronautics and Space Administration Lewis Research Center, Cleveland Ohio

ALUMINUM BLADE DEVELOPMENT FOR THE MOD-OA 200-KILOWATT WIND TURBINE Final Report

Bradford S Linscott, Richard K Shaltens, and A G Eggers (Westinghouse Electric Corp., Pittsburg) Dec 1981 43 p refs (Contract DE-AB29-76ET-20370)

(NASA-TM-82594, DOE/NASA-20370/20) Avail NTIS HC A03/MF A01 CSCL 10A

The rotor blade configuration, fabrication methods, analyses, operating experience, design modifications, and cost are described Each 60-ft -(18 3-m-) long aluminum blade used current aircraft fixed wing and rotary wing design and fabrication technologies Structural damage, repairs, and modifications that occurred during 6500 hours of operation are summarized

N82-14642# United Technologies Corp., South Windsor, Conn. Power Systems Div

INVESTIGATION OF THE IN-SITU OXIDATION OF METHA-NOL IN FUEL CELLS Final Report, Jun. 1980 - May 1981

D A Landsman and F J Luczak Sep 1981 32 p refs
(Contract DAAK70-80-C-0049, DA Proj 1L1-61102-AH-51)
(AD-A105947, FCR-3463) Avail NTIS HC A03/MF A01 CSCL 10/2

Direct anodic oxidation and internal reforming were examined as ways of using methanol as fuel in a phosphoric acid fuel cell The literature was reviewed to identify the most effective catalysts for the direct electrochemical oxidation of methanol It is shown that, even with the best of these catalysts, anode polarization at practical current densities is 300 mV higher on methanol than on hydrogen It was also found that unreacted methanol which diffuses across the cell can cause severe polarization of the cathode Theoretical and experimental studies of internal reforming showed that a fuel cell will generate sufficient waste heat to sustain the methanol steam reforming reaction Thus, thermally integrated, internal reforming is a feasible alternative to external reforming. The reforming catalyst is preferably located in separate chambers built into the stack, since this prevents phosphoric acid from attacking the reforming catalyst and methanol from migrating to the cathode Author (GRA)

N82-14666# Bonn Univ (West Germany) Inst fuer Physikalische Chemie

ELECTRODES AND DIAPHRAGMS FOR FUEL CELLS Final Report, Dec. 1979

Wolf Vielstich and Ernst Knauf Bundesministerium füer Forschung und Technologie Feb 1981 45 p refs In GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-81-047, ISSN-0340-7608) Avail HC A03/MF A01, Fachinformationszentrum, Karlsruhe, Germany DM 9.50

Nickel whisker electrodes with variations in network structure, pore size, and metal coatings were produced for use in water electrolytic cells and fuel cells. The resistance due to gas bubbles was decreased considerably by slits milled into the electrode Platinization was optimized for use in glycol/air cells and glycol anodes with constantly good anode potentials were obtained with whisker structures by standardization of the platinization process it is concluded that the activity of the glycol anodes depends strongly on the procedure of deposition of the noble metals and less on the whisker structure as such

Author (ESA)

N82-15454# Los Alamos Scientific Lab , N Mex FAILURE MODE ANALYSIS USING STATE VARIABLES DERIVED FROM FAULT TREES WITH APPLICATION

Robert J Bartholomew 1981 11 p refs Presented at the ANS/ENS Topical Meeting on Probabilistic Risk Assessment, Port Chester, N.Y., 20-24 Sep 1981

(Contract W-7405-eng-36)

(DE81-030239, LA-UR-81-2595, CONF-810905-3)

NTIS HC A02/MF A01

Fault Tree Analysis (FTA) is used extensively to assess both the qualitative and quantitative reliability of engineered nuclear power systems employing many subsystems and components FTA is very useful, but the method is limited by its inability to account for failure mode rate of change interdependencies (coupling) of statistically independent failure modes. The state variable approach (using FTA derived failure modes as states) overcomes these difficulties and is applied to the determination of the lifetime distribution function for a heat pipe thermoelectric nuclear power subsystem. Analyses are made using both Monte Carlo and deterministic methods and compared with a Markov model of the same subsystem. DOF

N82-15527*# Burns and Roe, Inc., Woodbury, N. Y. MHD OXIDANT INTERMEDIATE TEMPERATURE CERAMIC **HEATER STUDY Final Report**

A W. Carlson, I L Chait, D. P Saari, and C. L Marksberry Sep 1981 199 p refs Prepared in cooperation with Fluidyne **Engineering Corp**

(Contract DEN3-107, DE-AI01-77ET-10769)

(NASA-CR-165453. DOE/NASA-0107/3)

HC A09/MF A01 CSCL 10A

The use of three types of directly fired ceramic heaters for preheating oxygen enriched air to an intermediate temperature of 1144K was investigated. The three types of ceramic heaters are (1) a fixed bed, periodic flow ceramic brick regenerative heater, (2) a ceramic pebble regenerative heater. The heater design, performance and operating characteristics under conditions in which the particulate matter is not solidified are evaluated. A comparison and overall evaluation of the three types of ceramic heaters and temperature range determination at which the particulate matter in the MHD exhaust gas is estimated to be a dry powder are presented EAK.

N82-15561# Sandia Labs , Albuquerque, N Mex. PROJECT DEEP STEAM: FOURTH MEETING OF THE TECHNICAL ADVISORY PANEL

R L. Fox, A B Donaldson, S W Eisenhawer, C M Hart, D. R Johnson, A J Mulac, J R Wayland, and L J Weirick Jul.
1981 104 p Proceedings of Meeting held at Albuquerque, N Mex , 4-5 Nov 1980

(Contract DE-AC04-76DP-00789)

(DE81-029457, SAND-81-0043)

HC A06/MF A01

NTIS Avail:

The status of project DEEP STEAM was reviewed. Proceedings, are divided into five main sections (1) the injection string modification program. (2) the downhole steam generator program, (3) supporting activities, (4) field testing; and (5) recommendations and discussion

N82-15580# Midwest Research Inst., Golden, Colo Solar **Energy Research Inst**

OVERVIEW AND FY 1981 PROGRESS ON OPEN-CYCLE OTEC POWER SYSTEMS

T R Penney and B Shelpuk Aug 1981 7 p refs Presented at the Oceans Conf., Boston, 19-21 Sep 1981 (Contract EG-77-C-01-4042)

(DE81-029277, SERI/TP-634-1282, CONF-810911-3) Avail:

NTIS HC A02/MF A01

Progress in an advanced research and development program studying viable alternatives to closed cycle OTEC is reported Work on a 100 MWe steam turbine, heat exchangers, and deaeration for Claude or open cycle OTEC systems are reported Capsule descriptions of ocean energy conversion techniques are given, including wave energy conversion, ocean current energy conversion, and salinity gradient energy conversion as well as varieties of ocean thermal energy conversion

N82-15893# Department of Energy, Washington, D. C Office of Energy Research TECHNOLOGY OF CONTROLLED NUCLEAR FUSION

F. H Tenney, ed. and C C Hopkins, ed Jul. 1981 644 p refs Proceedings of the 4th ANS Topical Meeting held at King of Prussia, Pa., 14-17 Oct 1980 Sponsored in part by DOE, Washington, D.C and EPRI

(DE81-027361, CONF-801011-Vol-3) HC A99/MF A01

An assessment of magnetically confined fusion power reactors, their technological use and applications, is made. The key engineering areas studied relate to: thermomechanics, thermonydraulics, electromagnetics, nucleonics, systems engineering, assembly, maintenance, repair, instrumentation and control of reactors and reactor materials. The subjects of safety factors, laser applications, and wall design are also addressed.

144

06

ENERGY TRANSPORT, TRANSMISSION, AND DISTRIBUTION

Includes transport of fuels by pipelines, tubes, etc., microwave power transmission, and superconducting power transmission.

A82-10806 Heat Transfer - Milwaukee 1981; Proceedings of the Twentieth National Heat Transfer Conference, Milwaukee, WI, August 2-5, 1981. Conference sponsored by the American Institute of Chemical Engineers and American Society of Mechanical Engineers Edited by R P Stein (Argonne National Laboratory, Argonne, IL) AICHE Symposium Series, vol 77, no 208, 1981 435 p

Aspects of direct contact heat transfer are considered along with transport phenomena in fusion reactors, enhanced nucleate boiling, flow boiling, heat transfer in non-Newtonian systems, two-phase systems, heat transfer in fossil fuel conversion systems, process heat transfer, thermal and hydraulic behavior in rod and tube bundles. and two-phase systems in rod and tube bundles. Attention is also given to solar energy heat transfer, heat transfer in fluidized beds. and fire and combustion fundamentals, taking into account thermal stress oscillations induced by dynamic instabilities in radiationheated boiler tubes, convection losses from a cavity receiver. numerical solutions of turbulent models for flow over a flat plate with angle of attack, and the heat transfer from smooth horizontal tubes immersed in gas fluidized beds. A description is provided of aspects of turbulent combustion modelling, the exhaust gas emission from a swirl stabilized combustor, the analytical solution for diffusion in the core of a droplet with internal circulation, and the radiant ignition of a thin combustible solid

A82-11743 * # Solar power satellite microwave power transmission and reception system. W Finnell (NASA, Marshall Space Flight Center, Huntsville, AL). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 266-271. 10 refs.

The microwave power transmission and reception system of the Satellite Power System (SPS) has been intensively reviewed and assessed in a three-year concept development and evaluation program. This paper will review some concepts of SPS with particular emphasis on the design of the microwave power transmission and reception system. Technology requirements and proposals for meeting them will be discussed for various parts of the microwave system and to some degree for critical components such as power amplifiers. Specific subjects to be discussed are SPS concepts, antenna design, phase control, rectenna, and technology. (Author)

A82-11744 * # Antenna optimization and cost consideration for the Solar Power Satellite microwave system. E M Kerwin, J. H. Suddath, and G. D. Arndt (NASA, Johnson Space Center, Houston, TX). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 272-277 10 refs.

The sizing, criteria, cost analysis, and optimized taper of the Solar Power Satellite (SPS) transmitting antenna are discussed. The sizing parameters considered were a thermal limit of 23 kW/sq m in the antenna, a peak power density of 23 mW/sq cm in the ionosphere, and cost effectiveness. Cost schedules and equations are presented for the SPS, and four antenna tapers are analyzed and compared, including the reference 10 dB Gaussian taper. An even powered quadratic series is formulated to minimize electricity cost and stay within thermal and ionospheric power level limits. The optimized Johnson Space Center taper is found to display the lowest energy costs, 4% below the 10 dB Gaussian, and can deliver 5.69 GW

at 45.4 mills/kWh to the grid Further studies are indicated for the optimal antenna and rectenna sizes.

M.S.K.

A82-11746 # Applications of power beaming from space-based nuclear power stations. J. R. Powell, T E Botts (Brookhaven National Laboratory, Upton, NY), and A. Hertzberg (Washington, University, Seattle, WA). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1 New York, American Society of Mechanical Engineers, 1981, p 288-295 10 refs. Research supported by the U.S. Department of Energy.

Power beaming from space-based nuclear reactors to earth, aircraft, or spacecraft is offered as an alternative to the SPSS A rotating bed reactor (RBR) is described, in which the nuclear fuel is an annular bed of small particulates held in a rotating basket through which a coolant passes. Advantages over a previous nuclear rocket program, NERVA, are given as minimized size, external moderation and reflection, and several GW available from a reactor about one cu m in size. Testing of a model fluidized bed is described, noting favorable results from U-233 fuel, a projected 50 cm diam bed, and total mass of 3 metric tons. Two Brayton cycle generator systems are examined, and it is found that a turbine inlet temperature of 2,000 K and a simple Brayton cycle without regeneration yields a best efficiency of 30%. The RBR components are discussed, and microwave and laser power beaming systems are compared, economic projections indicate laser beaming to cruising aircraft is competitive with current let fuel use

A82-12503 # Microwave power transmission by satellites. W. Keydel (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Hochfrequenztechnik, Oberpfaffenhofen, West Germany). In International Scientific Conference on Space, 21st, Rome, Italy, March 25, 26, 1981, Proceedings.

Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1981, p. 29-38, 16 refs.

The MPTS (microwave power transmission system) is examined with regard to the problems involved, the proposed solutions, the future outlook, and the necessity for further work. The MPTS is analyzed with regard to system considerations, design considerations (power transmission, frequency selection, power generation, the spacetenna, microwave-propagation problems, the rectenna, and efficiency), environmental impacts (electromagnetic compatibility and RF interference, and health and ecological effects). It is concluded that the MPTS is feasible, but that further studies are needed to optimize the system with respect to such factors as efficiency and environmental impact.

A82-12504 # Mechanical and nonlinear effects in microwave power transmission. G Franceschetti and I Pinto (Napoli, Università, Naples, Italy). In International Scientific Conference on Space, 21st, Rome, Italy, March 25, 26, 1981, Proceedings

Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1981, p. 39-41. 11 refs.

The radiation recoil force arising in the spacetenna-rectenna link of a microwave power transmission system is discussed Consideration is also given to power-wasting nonlinear phenomena (harmonic generation) that could be excited by the microwave beam passing through the ionosphere. Nonlinear effects that may occur in the spacetenna and rectenna are also examined.

B J

A82-16991 Space chamber experiments of ohmic heating by high power microwave from the Solar Power Satellite. N. Kaya (Kobe University, Kobe, Japan) and H. Matsumoto (Kyoto University, Uji, Japan) Geophysical Research Letters, vol. 8, Dec 1981, p. 1289-1292 9 refs.

The prediction is made that a high power microwave from the Solar Power Satellite (SPS) interacts nonlinearly with the ionospheric plasma. The possible nonlinear interactions comprise ohmic heating and self-focusing and parametric instabilities. A laboratory experiment in a space plasma simulation chamber is carried out in order to examine ohmic heating in detail. A significant microwave heating plasma up to 150% temperature increase is observed with little electron density decrease. It is shown that the temperature increase is not due to the RF breakdown but to the ohmic heating in the simulated ionospheric plasma.

06 ENERGY TRANSPORT, TRANSMISSION, AND DISTRIBUTION

A82-17127 The significance of hydrogen as future secondary energy carrier (Die Bedeutung von Wasserstoff als zukunftiger Sekundärenergieträger). J. Nitsch (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für technische Physik, Stuttgart, West Germany). DFVLR-Nachrichten, Nov. 1981, p 2-6. In German.

An analysis is conducted concerning the possibilities for satisfying future energy requirements. Different types of energy requirements are considered together with the various classes of fuels which are currently employed to satisfy these requirements, taking into account developments that are changing present relationships. An investigation is conducted of alternate possibilities for supplying needed secondary gaseous energy carriers. According to one of the considered possibilities, hydrogen is to be provided by processes based on a large-scale utilization of solar energy. The structure of a hydrogen economy is discussed and questions regarding the economics of a use of hydrogen are explored. It is concluded that an employment of hydrogen as energy carrier depends also with respect to economic considerations primarily on the cost of electric energy. A description of the advantages of a hydrogen economy is also provided.

A82-17976 International Microwave Symposium, Los Angeles, CA, June 15-19, 1981, Proceedings. Symposium sponsored by the Institute of Electrical and Electronics Engineers and International Union of Radio Science. Edited by R. L. Eisenhart (Hughes Aircraft Co., Culver City, CA). IEEE Transactions on Microwave Theory and Techniques, vol. MTT-29, Dec. 1981. 144 p.

Papers presented in this volume cover diverse areas related to microwaves, including semiconductor devices, medical applications, circuit design, propagation, field theory, power, surface acoustic waves, ferrites, and measurements. Papers are included on the hybrid mode analysis of microstrip lines on anisotropic substrates, horn image-guide leaky-wave antenna, status of the microwave power transmission components for the solar power satellites, and analysis of microstrip circuits coupled to dielectric resonators.

A82-17982 * Status of the microwave power transmission components for the solar power satellite. W. C. Brown (Raytheon Co., Microwave and Power Tube Div., Waltham, MA). (Institute of Electrical and Electronics Engineers and International Union of Radio Science, International Microwave Symposium, Los Angeles, CA, June 15-19, 1981.) IEEE Transactions on Microwave Theory and Techniques, vol. MTT-29, Dec. 1981, p. 1319-1327. 14 refs. Research supported by the U.S. Department of Energy and NASA.

During the 1970-1980 time period a substantial advance has been made in developing all portions of a microwave power transmission system for the solar power satellite (SPS). The most recent advances pertain to the transmitting portion of the system in the satellite and are based upon experimental observations of the use of the magnetron combined with a passive directional device to convert it into a highly efficient directional amplifier with excellent low-noise properties and potentially very long life. The ability of its microwave output to track a phase reference makes it possible to combine it with many other radiating units to provide a highly coherent microwave beam. The ability of its output to track an amplitude reference while operating from a dc power source with varying voltage makes it possible to eliminate most of the power conditioning equipment that would otherwise be necessary. (Author)

N82-11255# Pittsburg Energy Technology Center, Pa Combustion Technology Div

TRANSPORT CHARACTERISTICS OF ALTERNATE SLURRY **FUELS** Quarterly Technical Progress Report, Apr. - Jun. 1981

1981 5 p Sponsored by DOE

(DE81-028580, DOE/TIC-1028580)

HC A02/MF A01

Progress is reported in an effort to develop flow data for various alternate fuels, such as coal/water mixtures, in a pump loop which accurately simulates fuel feed systems found in boiler and furnace applications. Instruments and procedures were selected for the measurement and correlation of pressure loss as a function of slurry characteristics and system design. An

existing loop was redesigned by lengthening both the vertical and horizontal straight sections and by simplifying the tank discharge/pump suction inlet section to eliminate unnecessary bends or elbows. Locations were selected for the pressure measurements, temperature measurements, flow measurements, and grab sample ports. A data acquisition system was defined

N82-12520# Skelly and Loy, Harrisburg, Pa EVALUATION OF NOVEL UNDERGROUND TRANSPORT **SYSTEMS** Final Report

Jun 1981 134 p refs (Contract DE-AC01-79ET-11268)

(DE81-030279, DOE/ET-11268/T3)

NTIS Avail

HC A07/MF A01

The feasibility of new or novel underground haulage equipment for transporting personnel and supplies is assessed to determine their relative impact on productivity and the cost per ton that is attributable to this segment of the mining operation. Novel equipment in its current design can potentially alleviate many of the personnel and supply problems encountered in United States coal mines A review of rail haulage systems and European underground mining provided the basis for the introduction of three novel haulage systems monorail, floor-mounted trapped rail haulage, and chairlifts. It was determined that monorail and floor-mounted trapped rail haulage systems exhibit the highest potential for domestic utilization. Monorail haulage equipment along with conventional battery powered rubber-tired equipment and two rail haulage systems were theoretically applied to five different mine sizes. Each system was then reviewed on an economic, operational, maintenance, and safety basis. From each standpoint, the monorail compared favorably with the other haulage systems

N82-12525# Battelle Columbus Labs , Ohio EXTENSIBLE BRIDGE CONVEYOR CONCEPTS FOR COAL-MINE FACE HAULAGE Final Technical Report James C Swain, David L Thomas, and Edward C Mullen 1981

(Contracts DE-AC01-79ET-14210, DI-DM-JO-177051) (DEB1-031974. DOE/ET-14210/T1) Avail

NTIS

HC A05/MF A01

The objective was to develop design concepts for extensible bridge conveyors which can be used in multiples to form a continuous haulage system Consultation services were provided by Jeffrey Mining Machinery Division on mining technology and B F Goodrich Engineered Systems Division on conveyor belt technology Additional information was gathered in a mine visit, during visits to conveyor manufacturers, and contacts with several component suppliers. Three extensible conveyor approaches were selected and machinery arrangement and internal detail drawings were prepared for each. Two of the concepts are for a face haulage system in which separate nonconnected extensible conveyors are individually trammed into position to form a continuous haulage system. The third concept is for a connected extensible system similar to existing continuous face haulage systems but employing extensible rather than fixed-length bridges Cost estimates were prepared for the three concepts. The concepts developed employ belt-type conveyors, however, chain-type conveyors were considered to be a viable alternative

N82-12538*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex WORKSHOP ON MICROWAVE POWER TRANSMISSION AND RECEPTION. WORKSHOP PAPER SUMMARIES 1980 1366 p refs Workshop held in Houston, Tex. 15-18 Jan 1980 Document contains eight bound supplements (NASA-TM-84064) Avail NTIS HC A99/MF A01 CSCL 10A

Microwave systems performance and phase control are discussed Component design and reliability are highlighted. The power amplifiers, radiating elements, rectennas, and solid state configurations are described. The proper sizing of microwave transmission systems is also discussed

N82-12539*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex SYSTEM PERFORMANCE CONCLUSIONS

G D Arndt In its Workshop on Microwave Power Transmission and Reception 1980 p 1-12

Avail NTIS HC A99/MF A01 CSCL 10A

System sizing is discussed in terms of reduced power levels and antenna diameters smaller than 1 km. The microwave transmission efficiency for smaller SPS systems was investigated Startup and shutdown operations were examined with emphasis on solar eclipse effects on the solar arrays. The antennas and subarray mechanical alignments are also discussed.

N82-12541*# Axiomatix, Los Angeles, Calif AN ACTIVE ALIGNMENT SCHEME FOR THE MPTS ARRAY

Richard Iwasaki In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 26-31

Avail NTIS HC A99/MF A01 CSCL 10A

In order to maximize the efficiency of the microwave power transmission system (MPTS), the surface of the array antenna must be extremely flat, which is difficult to achieve using passive techniques over the 1 km dimensions of the array. In order to achieve and maintain this required flatness, a rotating laser beam used for leveling applications on Earth was utilized as a reference system. A photoconductive sensor with a reflective collecting surface was used to determine the displacement and polarity of any misalignment and automatically engage a stepping motor to drive a variable-length mechanism to make the necessary corrections. Once aligned, little power is dissipated since a nulling bridge circuit that centers on the beam is used, an important alignment feature since even laser beams broaden considerably at 1 km distances.

N82-12542*# Los Alamos Scientific Lab , N Mex IONOSPHERIC POWER BEAM STUDIES

Lewis M Duncan and William E Gordon (Rice Univ.) In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 32-43

Avail NTIS HC A99/MF A01 CSCL 10A

A power density level of 23 mW/sq cm is presented as a design specification based on theoretical calculations of a threshold for microwave ionosphere nonlinear interaction (thermal runaway). For comparable power densities, enhanced electron heating is observed to change the electron temperature by a factor of two or three, but not by an order of magnitude.

N82-12543*# Emmanuel Coll, Boston, Mass PROPOSED EXPERIMENTAL STUDIES FOR ASSESSING IONOSPHERIC PERTURBATIONS ON SPS UPLINK PILOT BEAM SIGNAL

Santimay Basu and Sunanda Basu In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 44-54 refs

(Contract F19628-78-C-0005, Grant NSF ATM-78-25264) Avail NTIS HC A99/MF A01 CSCL 10A

The microwave beam of the proposed Solar Power Satellite (SPS) at geosynchronous altitude is to be formed and directed by phase information derived from a pilot signal at 2.45 GHz transmitted from ground and received in a number of module locations on the SPS antenna. The frequency of the pilot signal was chosen to be sufficiently low as to avoid the effects of strong scattering by turbulence in the neutral atmosphere and yet high enough to avoid any possible reofractive effects caused by the ionized upper atmosphere. The propagation of the uplink pilot signal through the ionosphere which contains natural and possibly some artificial irregularities, was studied.

N82-12546*# LinCom Corp., Pasadena, Calif COHERENT MULTIPLE TONE TECHNIQUE FOR GROUND BASED SPS PHASE CONTROL

C M Chie In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 85-94 refs

(Contract NAS9-15782)

Avail NTIS HC A99/MF A01 CSCL 10A

The ground based phase control concept was studied as an alternative approach to the reference SPS phase control system. The details of the ground based phase control system study are documented. The coherent multiple tone technique used for the ground based phase measurement waveform design and phase control system is summarized.

N82-12547*# Novar Electronics Corp. Barberton, Ohio AN INTERFEROMETER-BASED PHASE CONTROL SYSTEM

James H Ott and James S Rice In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 95-98 refs

Avail NTIS HC A99/MF A01 CSCL 10A

A system for focusing and pointing the SPS power beam is discussed. The system is ground based and closed loop. One receiving antenna is required on Earth. A conventional uplink data channel transmits an 8-bit phase error correlation back to the SPS for sequential calibration of each power module. Beam pointing resolution is better than 140 meters at the Rectenna.

N82-12548*# Novar Electronics Corp. Barberton, Ohio A SONIC SATELLITE POWER SYSTEM MICROWAVE POWER TRANSMISSION SIMULATOR

James H Ott and James S Rice In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 97-99 ref

Avail NTIS HC A99/MF A01 CSCL 10C

A simulator which generates and transmits a beam of audible sound energy mathematically similar to the SPS power beam is described. The simulator provides a laboratory means for analysis of ground based closed loop SPS phase control and of ionospheric effects on the SPS microwave power beam.

N82-12549*# Boeing Aerospace Co , Seattle, Wash SPS PHASE CONTROL STUDIES

W W Lund, B R Sperber, and G R Woodcock In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 100-109 Avail NTIS HC A99/MF A01 CSCL 10A

To properly point and form the SPS microwave power beam, the outputs of the power amplifiers in the transmitting array must be phased in a specific and coherent fashion. The purpose of the SPB phase control system is to bring this about reliably A number of different phase control schemes were studied. The one selected for the SPS baseline system is a retrodirective CW phase that is distributed via fiber optics. The basis of this selection is relative technical simplicity and requisite assurance of success.

N82-12550*# Boeing Aerospace Co., Seattle, Wash SPS FIBER OPTIC LINK ASSESSMENT

T O Lindsay and Ervin J Nalos In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 110-114

Avail NTIS HC A99/MF A01 CSCL 10A

Fiber optic technology was selected in the SPS baseline design to transmit a stable phase reference throughout the microwave array Over a hundred thousand microwave modules are electronically steered by the phase reference signal to form the power beam at the ground receiving station. The initially selected IF distribution frequency of the phase reference signal was set at 980 MHz or a submultiple of it. Fiber optics offers some significant advantages in view of the SPS application. Optical transmission is highly immume to EMI/RFI, which is expected to be severe when considering the low distribution power in addition, there will be savings in both mass, physical size, and potentially in cost.

N82-12551*# Rockwell International Corp. Pittsburgh, Pa IONOSPHERIC EFFECTS IN ACTIVE RETRODIRECTIVE ARRAY AND MITIGATING SYSTEM DESIGN

A K Nandi and C Y Tomita In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 115-125 refs

Avail NTIS HC A99/MF A01 CSCL 10A

The operation of an active retrodirective array (ARA) in an ionospheric environment (that is either stationary or slowly-varying) was examined. The restrictions imposed on the pilot-signal structure as a result of such operation are analyzed. A 3-tone pilot beam system is defined which first estimates the total electron content along paths of interest and then utilizes this information to aid the phase conjugator so that correct beam pointing can be achieved.

N82-12552*# Boeing Aerospace Co., Seattle, Wash HIGH EFFICIENCY SPS KLYSTRON DESIGN

Ervin J Nalos *In* NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 127-136

Avail NTIS HC A99/MF A01 CSCL 10A

The most likely compact configuration to realize both high efficiency and high gain is a 5-6 cavity design focused by an electromagnet An outline of a potential klystron configuration is given. The selected power output of 70 kW CW resulted from a maximum assumed operating voltage of 40 kV. The basic klystron efficiency cannot be expected to exceed 70-75% without collector depression. Although impressive gains were achieved in raising the basic efficiency from 50% to 70% or so with a multi-stage collector, the estimated efficiency improvement due to 5-stage collector at the 75% level is only about 8% resulting in an overall efficiency of about 83%.

N82-12553*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

ANALYTIC INVESTIGATION OF EFFICIENCY AND PERFORMANCE LIMITS IN KLYSTRON AMPLIFIERS USING MULTIDIMENSIONAL COMPUTER PROGRAMS; MULTISTAGE DEPRESSED COLLECTORS; AND THERMIONIC CATHODE LIFE STUDIES

H G Kosmahl *In* NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 139-146 refs

Avail NTIS HC A99/MF A01 CSCL 10A

Due to complexity of the program which used a hydrodynamic, axially and radially deformable disk-ring model and the resulting long computing time only the output gap was investigated Results from independent studies were used to initiate the starting conditions for the electrons and the RF voltage using our program Although this method of computation is less exact than processing the entire klystron interaction in 3-Dimensions it is shown that, for a confined flow focused throughout the penultimate cavity, radial velocities remain very small and the beam is highly laminar it is concluded that possible errors resulting from treating only the output cavity in 3-D would remain small

N82-12554*# Raytheon Co , Waltham, Mass New Products Center

THE ADAPTING OF THE CROSSED-FIELD DIRECTIONAL AMPLIFIER TO THE REQUIREMENTS OF THE SPS Progress Report

William C Brown In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 147-155 refs

Avail NTIS HC A99/MF A01 CSCL 10A

Progress in adapting the crossed-field directional amplifier to the SPS is reviewed. Special emphasis is given to (1) recent developments in controlling the phase and amplitude of the microwave power output. (2) a received architecture for its placement in the subarray, and (3) recent developments in the critical pivotal areas of noise, potential cathode life, and efficiency.

Author

N82-12555*# Boeing Aerospace Co., Seattle, Wash SPS ANTENNA ELEMENT EVALUATION

C D Lunden, W W Lund, and Ervin J Nalos In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 158-165

Avail NTIS HC A99/MF A01 CSCL 10A

The SPS transmitting array requires an architecture which will provide a low weight, high efficiency and high structural rigidity. Waveguide slot arrays constitute the most desirable option Consequently, such an array was chosen for the SPS Waveguide slot arrays offer high efficiency, uniform illimination, and are fairly lightweight. Bandwidths of such arrays are narrow, typically 1/2-2% Although this does not directly impact the SPS, which transmits power at a single frequency of 2 45 GHz, the narrow bandwidth does constrain the thermal and mechanical tolerances of the antenna. The purpose of this program is to better define the electronic aspects of an SPS specific waveguide slot array The specific aims of the program are as follows (1) To build a full-scale half-module, 10 stick, array, the design parameters for which are to be determined analytical considerations tempered by experimental data on a single slotted radiating stick, (2) To experimentally evaluate the completed array with respect to antenna pattern, impedance and return loss, and (3) To measure

swept transmission amplitude and phase to provide a data base for design of a receiving antenna LFM

N82-12556*# Rockwell International Corp., Pittsburgh, Pa THE RESONANT CAVITY RADIATOR (RCR)

K G Schroeder, R L Carlise, and C Y Tomita In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 167-177

Avail NTIS HC A99/MF A01 CSCL 10A

The fundamental theory of MW antenna operation and basic array technology development status was used in the design of the 1-km diameter 5-Gw SPS microwave antenna. However, the aperture size and the high efficiency requirements make the MW antenna extremely complex. Studies show that the slotted waveguide array is one of the most efficient radiators for the antenna. Subsequent analyses show that the temperature interface between waveguides and dc-RF conversion tubes can cause severe thermal design problems on the array. An alternate design, the Resonant Cavity Radiator, is described here.

N82-12557*# Boeing Aerospace Co., Seattle, Wash EVALUATION OF THICK WALL WAVE GUIDE ELEMENT Ervin J Nalos /n NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 180-187 Avail NTIS HC A99/MF A01 CSCL 10A

The SPS transmitting array requires an archetecture which will provide a low weight, high efficiency and high structural rigidity As noted above, waveguide slot arrays constitute the most desirable option. Consequently, such an array has been chosen for the SPS Waveguide slot arrays offer high efficiency, uniform illumination, are are fairly lighweight. Bandwidths of such arrays are narrow, typically 1/2-2% Although this does not directly impact the SPS, which transmits power at a single frequency of 2.45 GHz, the narrow bandwidth does constrain the thermal and mechanical tolerances of the antenna The purpose of this program is to better define the electronic aspects of an SPS specific waveguide slot array. The specific aims of the program are as follows (1) To build a full-scale half-module, 10 stick, array, the design parameters for which are to be determined by analytical considerations tempered by experimental data on a single slotted radiating stick, (2) To experimentally evaluate the completed array with respect to antenna pattern, impedance and return loss, and (3) To measure swept transmission amplitude and phase to provide a data base for design of a receiving

N82-12558*# Raytheon Co , Waltham, Mass New Products Center

METHOD FOR PRECISION FORMING OF LOW-COST, THIN-WALLED SLOTTED WAVEGUIDE ARRAYS FOR THE SPS

William C Brown In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 188-190

Avail NTIS HC A99/MF A01 CSCL 10A

A method for the precision-forming of thin-walled, slottedwaveguide arrays was devised. Models were constructed with temporary tools and evaluated. The application of the method to the SPS requirements is discussed. Author

N82-12559*# Georgia Inst of Tech, Atlanta Engineering Experiment Station

CONSIDERATIONS FOR HIGH ACCURACY RADIATION EFFICIENCY MEASUREMENTS FOR THE SOLAR POWER SATELLITE (SPS) SUBARRAYS

D J Kozakoff, J M Schuchardt, and C E Ryan In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 191-200 refs

(Contract NAS8-33605)

Avail. NTIS HC A99/MF A01 CSCL 10A

The relatively large apertures to be used in SPS, small half-power beamwidths, and the desire to accurately quantify antenna performance dictate the requirement for specialized measurements techniques. Objectives include the following (1) For 10-meter square subarray panels, quantify considerations for measuring power in the transmit beam and radiation efficiency to + or - 1 percent (+ or - 0.04 dB) accuracy (2) Evaluate measurement performance potential of far-field elevated and ground reflection ranges and near-field techniques.

(3) Identify the state-of-the-art of critical components and/or unique facilities required (4) Perform relative cost, complexity and performance tradeoffs for techniques capable of achieving accuracy objectives the precision required by the techniques discussed below are not obtained by current methods which are capable of + or - 10 percent (+ or - dB) performance in virtually every area associated with these planned measurements, advances in state-of-the-art are required.

N82-12560* Raytheon Co , Waltham, Mass New Products Center

THE HISTORY OF THE DEVELOPMENT OF THE RECTENNA

William C Brown In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 203-212 refs

Avail NTIS HC A99/MF A01 CSCL 10A

The history of the development of the rectenna is first reviewed through its early conceptual and developmental phases in which the Air Force and Raytheon Company were primarily involved The intermediate period of development which involved NASA, Jet Propulsion Laboratory, and Raytheon is then reviewed Some selective aspects or the current SPS rectenna development are examined

Author

N82-12561*# Boeing Aerospace Co , Seattle, Wash RECTENNA SYSTEM DESIGN

G R Woodcock and R W Andryczyk (GE) In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 213-222

Avail NTIS HC A99/MF A01 CSCL 10A

Various rectenna system options are discussed. Among these are the half-wave dipole, modified half-wave dipole, yagi, half-wave dipole stripline, air dielectric transmission line feed, full wavelength dipole stripline, parabolic horn, and parabolic trough. L.F.M.

N82-12562*# Rensselaer Polytechnic Inst., Troy, N Y RECTENNA SESSION: MICRO ASPECTS

Ronald J Gutmann In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 223-231 refs

Avail NTIS HC A99/MF A01 CSCL 10A

Two micro aspects of rectenna design are discussed evaluation of the degradation in net rectenna RF to DC conversion efficiency due to power density variations across the rectenna (power combining analysis) and design of Yagi-Uda receiving elements to reduce rectenna cost by decreasing the number of conversion circuits (directional receiving elements). The first of these involves resolvinga fundamental question of efficiency potential with a rectenna, while the second involves a design modification with a large potential cost saving.

N82-12563*# Novar Electronics Corp., Barberton, Ohio A THEORETICAL STUDY OF MICROWAVE BEAM ABSORP-TION BY A RECTENNA

James H Ott, James S Rice, and Donald C Thorn In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1981 p 234-240 refs

Avail NTIS HC A99/MF A01 CSCL 10A

The results of a theoretical study of microwave beam absorption by a Rectenna are given Total absorption of the power beam is shown to be theoretically possible. Several improvements in the Rectenna design are indicated as a result of analytic modeling. The nature of Rectenna scattering and atmospheric effects are discussed.

N82-12564*# Jet Propulsion Lab , California Inst of Tech . Pasadena

RECTENNA ARRAY MEASUREMENT RESULTS .

Richard M Dickinson In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 244-250 refs

Avail NTIS HC A99/MF A01 CSCL 10A

The measured performance characteristics of a rectenna array are reviewed and compared to the performance of a single element. It is shown that the performance may be extrapolated from the individual element to that of the collection of elements. Techniques for current and voltage combining were demonstrated. The array performance as a function of various operating

parameters is characterized and techniques for overvoltage protection and automatic fault clearing in the array demonstrated A method for detecting failed elements also exists. Instrumentation for deriving performance effectiveness is described. Measured harmonic radiation patterns and fundamental frequency scattered patterns for a low level illumination rectenna array are presented.

N82-12565*# National Aeronautics and Space Administration Lyndon B Johnson Space Center, Houston, Tex

SESSION ON SOLID STATE: INTRODUCTION

In its Workshop on Microwave Power Transmission and Reception 1980 $\,$ p 253-257

Avail NTIS HC A99/MF A01 CSCL 10A

The possibilities of using solid state devices as part of the Satellite Solar Power System are discussed. Solid state advantages and disadvantages are presented along with two potential concepts for use of solid state in the system design. L.F.M.

N82-12566*# Boeing Aerospace Co., Seattle, Wash MODIFIED REFERENCE SPS WITH SOLID STATE TRANSMITTING ANTENNA

G R Woodcock and B R Sperber In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 258-267

Avail NTIS HC A99/MF A01 CSCL 10A

The motivations for considering solid state microwave power amplifiers for the solar power satellite transmitting antenna are the possibilities of greatly increased system reliability due to elimination of electron tube cathodes, a lower mass per unit power and transmitting array area due to the high power densities obtainable in semiconductors, and, probably, cost savings due to development of small hardware items that can be handled by individuals instead of organizations. In order to provide a fair assessment where we stand today with regard to solid state SPS technology, the design described here is close to that of the NASA/DOE reference and is implemented using today's solid state technology with only a small 'push'. The small push is raising the efficiency of DC-RF conversion from the 68 obtained by RCA in 1975 to somewhat over 8 of the solid state SPS This is generally considered feasible by semiconductor industry representatives Other solid state SPS configurations can yield somewhat better performance. However, these generally do not provide as fair a vehicle for comparison with the reference and usually also incorporate somewhat more advanced technologies

N82-12567*# Boeing Aerospace Co., Seattle, Wash SPS SOLID STATE ANTENNA POWER COMBINER

G W Fitzsimmons In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 268-277

Avail NTIS HC A99/MF A01 CSCL 10A

Solid state dc-rf converters offer potential improvements in reliability, mass and low voltage operation, provided that anticipated efficiencies in excess of 80 percent can be realized Field effect transistors offer the greatest potential in the SPS frequency band at 2.45 GHz. To implement this approach it is essential that means be found to sum the power of many relatively low power solid state sources in a low-loss manner, and that means be provided to properly control the phase of the outputs of the large number of solid state sources required. To avoid the power combining losses associated with circuit hybrids it was proposed that the power from multiple solid state amplifiers be combined by direct coupling of each amplifier's output to the radiating antenna structure. The selected power-combining antenna consists of a unique printed (metalized) microstrip circuit on a ceramic type dielectric substrate which is backed by a shallow lightweight aluminum cavity which sums the power of four microwave sources. The antenna behaves like two one-half wavelength slot-line antennas coupled together via their common cavity structure L F M

N82-12568*# Rockwell International Corp., Pittsburgh, Pa SOLID-STATE RETRODIRECTIVE PHASED ARRAY CON-CEPTS FOR MICROWAVE POWER TRANSMISSION FROM SOLAR POWER SATELLITE

K G Schroeder and I K Petroff In NASA Johnson Space Center Workshop on Microwave Power Transmission and Reception 1980 p 279-298 ref

Avail NTIS HC A99/MF A01 CSCL 10A

06 ENERGY TRANSPORT, TRANSMISSION, AND DISTRIBUTION

Two prototype solid-state phased array systems concepts for potential use in the Solar Power Satellite are described In both concepts, the beam is centered on the rectenna by means of phase conjugation of a pilot signal emanating from the ground Also discussed is on-going solid-state amplifier development

N82-13157# National Telecommunications and Information Administration Boulder Colo Inst for Telecommunication

EFFECTS OF THE SATELLITE POWER SYSTEM ON LOW EARTH ORBIT AND GEOSYNCHRONOUS SATELLITES W B Grant, E L Morrison, and J R Juroshek Jun 1981

86 p refs (Contracts DE-AI06-79RL-10077 DE-AI01-80ER-10160)

(PB81-232019 NTIA/Rept-81/75) NTIS HC A05/MF A01 CSCL 22A

The large amount of power contained in the main beam and principal sidelobes of the proposed Solar Power System (SPS), now under study by DOE and NASA, potentially presents an EMC problem for other satellite systems. This report examines selected geosynchronous orbit (GEO) satellites in adjacent slots to an SPS, GEO satellites on a chord passing an Earth horizon. and low-earth-orbit (LEO) satellites which may pass throught the SPS power beam. Potential functional and operational impacts to on-board systems are analyzed. Mitigation techniques for SPS effects are examined and recommendations summarized to allow satellites to operate satisfactorily in an SPS environment GRA

N82-13517# Brookhaven National Lab., Upton, N. Y CRYOGENIC TESTING OF 100-M SUPERCONDUCTING POWER TRANSMISSION TEST FACILITY

R. J. Gibbs, J E Jensen, and R A Thomas 1981 8 p refs Presented at 1981 Cryogenic Engr Conf., San Diego, 10. Aug

(Contract DE-AC02-76CH-00016)

(DE81-028331; BNL-29900; CONF-810835-2) Avail: NTIS HC A02/MF A01

The system was designed to cool the test facility for transmission cables. The system was modified to incorporate a fourth turbine placed remotely from the refrigerator at the far end of the load. In this configuration the load, consisting of the superconducting cables and their containment vessel, becomes a long counterflow heat exchanger with internal heat generation The results of these tests are presented with discussion of the operation, equipment performance, and possible areas for improvement.

N82-14202*# · National Aeronautics and Space Administration Langley Research Center, Hampton, Va

COMPARATIVE ANALYSES OF SPACE-TO-SPACE CEN-TRAL POWER STATIONS

Paul F Holloway and L Bernard Garrett Dec 1981 49 p

(NASA-TP-1955, L-14766) Avail NTIS HC A03/MF A01 CSCL 22B

The technological and economical impact of a large central power station in Earth orbit on the performance and cost of future spacecraft and their orbital transfer systems are examined It is shown that beaming power to remote users cannot be cost effective if the central power station uses the same power generation system that is readily available for provision of onboard power and microwave transmission and reception of power through space for use in space is not cost competitive with onboard power or propulsion systems. Laser and receivers are required to make central power stations feasible. Remote power transmission for propulsion of orbital transfer vehicles promises major cost benefits. Direct nuclear pumped or solar pumped laser power station concepts are attractive with laser thermal and laser electric propulsion systems. These power stations are also competitive, on a mass and cost basis, with a photovoltaic power station

N82-14484# Los Alamos Scientific Lab , N Mex COOL-DOWN FLOW-RATE LIMITS IMPOSED BY THERMAL STRESSES IN LNG PIPELINES

J K Novak, F J Edeskuty, and J R Bartlit 1981 8 p refs Presented at the Cryogenic Eng Conf., San Diego, Calif. 10-14 Aug 1981 (Contract W-7405-eng-36)

(DE81-028731, LA-UR-81-2365, CONF-810835-4) Avail NTIS HC A02/MF A01

Warm cryogenic pipelines are usually cooled to operating temperature by a small, steady flow of the liquid cryogen If this flow rate is too high or too low, undesirable stresses will be produced Low flow-rate limits based on avoidance of stratified two-phase flow were calculated for pipelines cooled with liquid hydrogen or nitrogen High flow-rate limits for stainless steel and aluminum pipelines cooled by liquid hydrogen or nitrogen were determined by calculating thermal stress in thick components vs flow rate and then selecting some reasonable stress limits The present work extends these calculations to pipelines made of AISI 304 stainless steel, 6061 aluminum, or ASTM A420 9% nickel steel cooled by liquid methane or a typical natural gas Results indicate that aluminum and 9% nickel steel components can tolerate very high cool-down flow rates, based DOE on not exceeding the material yield strength

N82-14638# Texas Technological Univ., Lubbock Plasma and Switching Lab

PULSED POWER RESEARCH COLLOQUIUM Annual Report

M Kristiansen, A H Guenther (Kirtland AFB, Albuquerque, NM), John Ungversky (AFWL, Kirtland AFB, Albuquerque, NM), F C Brockhurst (Air Force Inst. of Technology, Wright-Patterson, AFB. Ohio), R D Franklin (AFWAL), A K Hyder (AFOSR), and R L Gullickson (Defense Nuclear Agency) 9 Jul 1981 10 p refs (Grant AF-AFOSR-3675-78, AF Proj. 2301) NTIS

(AD-A105770, AFOSR-81-0686TR) Avail HC A02/MF A01 CSCL 10/2

A Pulsed Power Lecture Series is being conducted by Texas Tech University for the U.S. Air Force Modular instructional material for use in this lecture series is being developed. Each module is a self-consistent discussion of some aspect of pulsed power technology. The contents range from the very basic (e.g. basic EM field theory) to advanced, modern topics, such as magnetic switching. The lectures are delivered every two weeks at the Air Force Institute of Technology and the Air Force Weapons Laboratory The speakers then provide a written text of their lecture, which is edited and published in modular form by Texas Tech University It is planned to reissue these modules in report or book form at a later date. A total of about 50 modules are planned Some 30 lecturers have been presented, to date, and about 12 modules have been issued Author (GRA)

N82-15134# Technische Hochschule, Aachen (West Germany) Inst. fuer Kunststoffverabeitung in Industrie und Handwerk.

SELECTION AND TESTING OF SUITABLE COATING SYSTEMS FOR STEEL PIPES USED FOR LONG DISTANCE HEAT TRANSFER Final Report, May 1980

Ernst Braches Bonn Bundesministerium fuer Forschung und Technologie Aug 1981 85 p refs in GERMAN, ENGLISH summary Sponsored by Bundesministerium fuer Forschung und Technologie

(BMFT-FB-T-81-138; ISSN-0340-7608) NTIS HC A05/MF A01

Anticorrosion properties of buried, plastics-coated steel pipes for long-distance heat supply lines, with regard to the possible application limits are considered Quantitative measuring methods were used to determine the influence of various media, temperatures, and temperature changes on the protective effect of the composites systems. Electrochemical measuring methods (impedance and potential measurement), bond strength measurements and optical tests were employed. It was possible to achieve a very good differentiation between the level of protection offered by the individual coating systems and show how they were affected by the various kinds of stress applied. The electrochemical measuring methods, in particular, were outstandingly suitable for a quasi-nondestructive evaluation of a composite system subjected to various stresses. It was also possible to show that the PU coating system did not lose any of its protective properties in any of the tests

N82-15338# Brookhaven National Lab , Upton, N. Y. IMPROVED TECHNIQUE TO MEASURE ELECTRONICALLY AC LOSSES IN SUPERCONDUCTING CABLES

F. Schauer and M Meth 1981 8 p refs Presented at the Cryogenic Eng Conf., San Diego, Calif., 10-14 Aug 1981 (Contract DE-AC02-76CH-00016)

(DE81-029323, BNL-29932, CONF-810835-15) Avail. NTIS HC A02/MF A01

06 ENERGY TRANSPORT, TRANSMISSION, AND DISTRIBUTION

An improved electronic method for measuring ac losses in superconducting cables of lengths from 1m to 10m was developed. This method compensates for phase shifts in the measuring circuit elements and for imbalance of the difference amplifier due to changes in the common mode voltage. This measuring method is being further improved and adapted to the loss measurements of a 138V. 4 kA. 100 m long superconducting cable under construction.

07 ENERGY STORAGE

Includes flywheels, heat storage, underground air storage, compressed air, storage batteries, and electric hybrid vehicles

A82-10018 Thermal storage in salt-hydrates. M. Telkes (AEC Research Institute, Killeen, TX). In Solar materials science.
New York, Academic Press, 1980, p. 377-404.

Water itself has a rather high entropy of fusion per unit weight, and when combined with anhydrous salt of high entropy of fusion, a salt hydrate of conveniently lower melting point may result, usually with the combined high entropies of fusion of the components. Aspects of melting and recrystallization are discussed. Several methods have been developed to prevent the settling of residual solids in partly incongruently melting salt-hydrates, with the result that the conditions can become completely reversible. The properties of salt-hydrates are listed in a table. Attention is given to supercooling, nucleation or crystal seeding, the rate of crystal growth, the rate of heat removal, the calculation of the heat of fusion from heats of solution, the calculation of the heat of fusion from entropies of fusion, calorimetric measurements and data, and the properties of selected salt-hydrates.

G.R.

A82-10019 Thermodynamic basis for selecting heat storage materials. M. Telkes (AEC Research Institute, Killeen, TX). In Solar materials science. New York, Academic Press, 1980, p. 405-437. 25 refs.

The search for materials with high heat of fusion values can be based on theoretical considerations regarding the heat of fusion and its correlation with other known physical properties. Attention is given to investigations conducted by Kubaschewski (1949, 1959, 1967), Blanc (1958, 1959), and Ubbelohde (1950, 1957, 1965). It is found that Kubaschewski's rule can be applied to calculate the heat of fusion of inorganic compounds, by using definite values for the entropy of fusion per gram atom. It is pointed out that most of the theoretical work of the past has been hampered by lack of data on the heats of fusion of elements. Using recently published results a nearly complete table has been prepared, listing melting points, transition points, heats of fusion and transition, and entropies of fusion and transition.

G.R.

A82-11707 * # Development status of a regenerative fuel cell system for orbital operation, A. C. Erickson (General Electric Co., Wilmington, MA) and H. McBryar (NASA, Johnson Space Center, Houston, TX). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 67-73. 6 refs Contract No. NAS9-15831.

Mission studies conducted by NASA for future long-term orbital operations have indicated the need for substantial increases in the power level of low-earth orbital energy storage facilities by the mid-to-late 1980's. A description is presented of the results of a comprehensive study for a state-of-the-art assessment of solid polymer electrolyte electrochemical cell technology. Questions related to the weight optimization of the dedicated system are investigated, and attention is given to the analysis of a system having reversible modules capable of operating in either the electrolysis or fuel cell mode. It was found that performance improvements and weight reduction can be realized by advancing the state of the art of solid polymer electrolyte cell technology.

G.R.

A82-11714 # Effect of depth of discharge on cycle life of near-term batteries. H N. Seiger. In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. New York, American Society of Mechanical Engineers, 1981, p. 102-110. 35 refs. Research sponsored by the U.S. Department of Energy.

An investigation is conducted regarding the functional relationship between cycle life and depth of discharge (DOD) for lead-acid, nickel-iron, and nickel-zinc batteries. Also considered are the main factors affecting the degree to which cycle life is affected by DOD. The failure modes which affect the cycle life of the three systems are listed in a table. A semilogarithmic relationship between cycle life and DOD will be maintained for several years. Maximum energy is found to be related to battery voltage, DOD, and cycle life. G.R.

A82-11722 # Techniques and applications of pulsed power technology. M. F. Rose (U.S. Navy, Naval Surface Weapons Center, Dahlgren, VA). In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1. ______New_York, American Society of Mechanical Engineers, 1981, p. 146-154. 18 refs. Navy-supported research.

For the purpose of pulse power, energy is usually stored, at a slow rate, in some suitable media and subsequently released on demand at whatever rate is suitable. The time scales for delivery range from milliseconds to nanoseconds. The most demanding technical applications for this technology are in inertial confinement fusion and in military oriented programs. A description of the basic storage mechanisms is provided, taking into account the electrostatic storage of energy, magnetic/inductive storage, inertial energy storage, and chemical storage. A comparison of large storage systems is conducted, and aspects of load characterization are discussed. Attention is given to advanced applications and advanced requirements G.R.

A82-11735 # The nickel-hydrogen battery system - An historical overview. L. Miller (Eagle-Picher Industries, Joplin, MO). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 1.

New York, American Society of Mechanical Engineers,

New York, American Society of Mechanical Engineers, 1981, p. 220-223.

Around 1971, difficulties experienced in connection with the development of a regenerative or rechargeable hydrogen oxygen fuel cell for replacement of the nickel-cadmium system on Intelsat communication satellites resulted in the consideration of two related, alternative systems, including the oxygen-cadmium couple and the hydrogen-nickel couple. The oxygen-cadmium couple was soon eliminated for technical reasons. On the other hand, immediate achievement of success with the hydrogen-nickel couple resulted in its subsequent rapid development. A chronological review is provided of the major events leading up to the current system status of the nickel-hydrogen battery.

G.R.

A82-11737 # Ampere-hour integrator battery charge controller. G M Lehto and R M Martinelli (Hughes Aircraft Co., Space and Communications Group, El Segundo, CA) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1 New York, American Society of Mechanical Engineers, 1981, p. 232-234. In a spacecraft environment proper battery management is essential to ensure long battery life. A primary cause of reduced battery life is the improper rate and duration of battery charge. The Ampere-hour Integrator Battery Charge Controller presents a method of autonomous charge management which offers significant advances in the control of charge return to the battery. (Author)

A82-11774 * # NASA preprototype redox storage system for a photovoltaic stand-alone application. N. H. Hagedorn (NASA, Lewis Research Center, Cleveland, OH) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 1 New York, American Society of Mechanical Engineers, 1981, p. 805-811

A 1-kW preprototype redox storage system that has undergone characterization tests and been operated as the storage device for a 5-kW (peak) photovoltaic array is described and performance data are presented. Loss mechanisms are discussed, and simple design changes leading to appreciable increases in efficiency are suggested. The effects on system performance of nonequilibrium between the predominant species of complexed chromic ion in the negative electrode reactant solution are summarized. It is noted that with the aid of the prototype system, control concepts have been shown to be

07 ENERGY STORAGE

valid and trouble free and some insight has been gained into interactions at the mutual interfaces of the redox system, the photovoltaic array, the load, and the control devices

C R

A82-11779 # Method of determining the creep characteristics of composite materials. S. J. Calabrese and P. Smith (Rensselaer Polytechnic Institute, Troy, NY). In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 1 New York, American Society of Mechanical Engineers, 1981, p. 871-874. 5 refs. Research supported by the U.S. Department of Energy

This paper presents the test method used to establish the creep characteristics of composite materials which were selected for use in a flywheel energy storage system under contract to the Department of Energy. The test specimen, rig and environmental chamber were designed to obtain data under air and vacuum conditions. A capacitance measuring system was used to monitor displacement over a long period of time. Results of preliminary testing and a discussion of future work will be presented. (Author)

A82-11782 # Design considerations for a 1500 M head 300-600 MW double stage reversible pump/turbine with regulation. S A Chacour, J R Degnan, and R. K Fisher, Jr In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 1. New York, American Society of Mechanical Engineers, 1981, p 1014-1020. 6 refs

It is noted that much attention has recently been given to the development of high-head pumped storage schemes. The special design considerations required to develop the turbine machinery for this new category of service are presented. Also included is a discussion of the advanced computer-aided design and analytical tools now available to optimize the prototype equipment. Special manufacturing considerations and model testing philosophy are introduced. It is noted that an optimized final machine design results from computer-aided mechanical design, detailed structural analysis, and a prediction of fatigue life.

A82-11846 # Aquifer thermal energy storage - A feasibility study for large scale demonstration. W V Skinner and D J Supkow (Dames and Moore, Cranford, NJ) In Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volume 3 . New York, American Society of Mechanical Engineers, 1981, p. 2161-2166

Engineering procedures necessary for aquifer thermal energy storage (ATES), based on studies of the Magothy Aquifer on Long Island, NY, are presented, with chilled winter water pumped into the aquifer and reclaimed in summer months for air conditioning. The choice of aquifer involves necessary volume, flow rate, efficiency of thermal recovery, and avoidance of conflict with other users, utilization depends on choice of appropriate piping, heat exchangers, and well construction to prevent degradation of the aquifer. The methods employed to probe the Magothy for suitability are described, including drilling an asymmetric well cluster for observation, and 48 hr pumping and 8 hr recovery. Transmissivity was found to vary from 8,000 to 29,000 sq ft/day. A doublet well was then drilled and water withdrawn, chilled, and returned. Later withdrawal indicated a 46% thermal recovery, with computer models projecting 80% with additional cycling. The study verified the feasibility of ATES, which can be expanded with additional demand

A82-11847 # Planning an underground pumped hydro project for the Commonwealth Edison Company. H H Chen (Harza Engineering Co., Chicago, IL) and I A Berman (Commonwealth Edison Co., Chicago, IL) In: Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings Volume 3. New York, American Society of Mechanical Engineers, 1981, p. 2167-2171.

The conceptual project design for a one-drop 3 GW underground pumped hydro energy storage in Illinois is presented. A one-drop two stage design was chosen over a one-drop one stage and one and two stage two-drop designs for reasons of cost and flexibility. Water is to be pumped into a bisected upper reservoir set in preCambrian granite, which is sufficiently impermeable to water, the 10.4 million cum reservoir can then be used as a load leveler as it drains through a

pump/turbine into a 9.5 million cu m lower reservoir. Initial studies indicate that pumped hydro storage exceeds the efficiencies of both oil and peaking plant generation. Due to a decrease in the projected rate of increase of electrical demand, the project has been deferred, allowing time for work on ultrahigh-head pump turbines. M.S.K.

A82-13082 * Control of new energy sources in an electric utility system. H. Kirkham (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA). In Joint Automatic Control Conference, Charlottesville, VA, June 17-19, 1981, Proceedings. Volume 1

New York, American Institute of Chemical Engineers, 1981. 4 p. (WA-3B) Research sponsored by the U.S. Department of Energy and NASA

The addition of generators based on renewable resources to the electric power system brings new problems of control and communication if the generators are to be controlled as an integrated part of the power system. Since many of these generators are small, it will require a large number of them, connected to the distribution system, to represent an appreciable fraction of the total generation. This situation contrasts with present day generation control which typically involves only the control of a small number of large generators. This paper examines the system requirements for integrated control, and proposes a control arrangement in which the incremental cost of power is an important parameter (Author)

A82-13325 The new batteries. J. Hopkinson. *EPRI Journal*, vol. 6, Oct. 1981, p. 7-13.

The state of advanced battery concept development is reviewed, noting advantages of battery use such as modular design, short lead time from order to installation, and widely varying load operation Compact design, quietness, pollution free operation, and low maintenance are also favorable, utility uses are foreseen as load leveling for base load capacity, the opportunity for a spinning reserve, and VAR control. Research programs for ZnCl, ZnBr, and the beta battery are reviewed, and the use of Pb-acid batteries is noted to be reaching an end because of lead supply problems, pollution, and price fluctuations. A 50 kWh ZnCl battery has been built that has lasted through 2 cycles, and a 80kW ZnBr battery has recently tested successfully to prove the feasibility of scale-up. Functioning chemicals in the beta battery require over 300 C temperatures to work, beta aluminum, a ceramic, is used as an electrolyte and separator. Seals to contain the reactive chemicals within the battery and compartmentalize the electrolytes are a focus of continuing research.

A82-14513 † Optimum reinforcement shapes and paths for rotating composite shells (Optimal'nye formy i traektorii armirovaniia vrashchaiushchikhsia obolochek iz kompozitov). Iu. V Bokov, V. V. Vasil'ev, and G G. Portnov (Moskovskii Aviatsionnyi Tekhnologicheskii Institut, Moscow, USSR, Akademiia Nauk Latviiskoi SSR, Institut Mekhaniki Polimerov, Riga, Latvian SSR). Mekhanika Kompozitnykh Materialov, Sept.-Oct. 1981, p 846-854. 11 refs In Russian.

The paper deals with the problem of an optimum design for a composite flywheel in the form of a zero-moment shell of revolution fabricated by filament winding or by layup of orthotropic bands. The reinforcement paths and the shape of the generating line are derived for a uniformly stressed centrifugally loaded shell. A closed-form solution is obtained for the case of a composite lacking rigidity in the direction normal to the direction of reinforcement On the basis of the proposed solution, several classes of optimum shells are derived. The energy storage capacity of such shells is estimated and compared with that of rim-type flywheels.

A82-15726 Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6. K M. Abraham, J L Goldman, and M. D Dempsey (EIC Laboratories, Inc., Newton, MA) Electrochemical Society, Journal, vol. 128, Dec. 1981, p 2493-2501 21 refs. Grant No. DAAK20-79-C-0267

Various vanadium oxide compositions were synthesized and evaluated as rechargeable lithium/vanadium oxide cell cathodes using 2Me-THF/LiAsF6. The most useful compositions were found to be (1) VO(2.17), (2) VO(2.19), and (3) the Fe- or Cr-substituted oxide of apparent composition M(0.13)V(0.87)O(2.17). The superior rechargeability of VO(2.17) in practical high-capacity cells within

cycling limits of 3.0 and 1.9 V was demonstrated by the extended cycling of a cell with an average cathode utilization of about 0.52 electrons/vanadium in over 200 cycles Both VO(2 17) and VO(2 19) oxides require carbon in the cathode for acceptable performance, resulting in merely moderate volumetric energy densities. The incorporation of such metals as Cr or Fe into the vanadium oxide lattice is found to be useful in the synthesis of new cathode materials.

A82-15727 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries. F. W. Dampier (EIC Corp., Newton, MA) Electrochemical Society, Journal, vol 128, Dec. 1981, p. 2501-2506 29 refs Contract No EY-76-C-02-2520.

A82-17763 # A photovoltaic system with energy storage Natural Bridges National Monument 100-kW system. F. J. Solman, H. J. Bullwinkel, J. D. Doucet, and B. L. Brench (MIT, Lexington, MA). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0066, 9 p. 13 refs. Research sponsored by the U.S. Department of Energy.

A large, stand-alone photovoltaic power system with energy storage has been in operation for over 18 months at Natural Bridges National Monument in southeastern Utah, Operating results for the system are in substantial agreement with simulations done before construction. Measured data are now available for the battery performance over this period. The design considerations and how they were realized are reviewed as are the departures from predicted performance. The performance of a digital state-of-charge meter used for battery management is also discussed. (Author)

A82-17770 # Performance of a cylindrical phase change thermal energy storage unit. R. Ponnappan and D. L. Jacobson (Arizona State University, Tempe, AZ). American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 20th, Orlando, FL, Jan. 11-14, 1982, Paper 82-0076. 9 p. 13 refs. Contract No. F33615-77-C-2059.

The high-temperature performance of a eutectic salt Phase Change Material (PCM) in a cylindrical Thermal Energy Storage Container (TESC) sample is evaluated by means of an experimental apparatus with a water-circulated calorimeter. The phase change characteristics of the salt during melting and solidification were observed by monitoring the external axial temperature profile of the container, and the analysis of the phase change heat transfer in the cylindrical geometry was based on the modified heat balance integral method of Tien (1980), which provides the solidification rate and time. Melting point (983 K), freezing point (944 K), latent heat of fusion (782.26 J/gm) and thermal diffusivity (0.00799 sq cm/sec) results are in agreement with those found in the literature. The experimental and analytical results of the nondimensionalized heat transfer resistance as a function of the solidified or melted weight fraction are compared.

Life-testing of 1.7 kW h zino-chloride battery system - Cycles 1 - 1000. C. M. Blevins (Energy Development Associates, Madison Heights, MI). Journal of Power Sources, vol. 7, Jan. 1982, p. 121-132. 5 refs. Research supported by the Electric Power Research Institute and Gulf and Western Industries.

A 1.7 kW h zinc-chloride battery system was built in 1976 for electric vehicle and load-leveling applications. As of June 1979, the two-volt, multiple-cell battery stack, which embodies porous graphite-chlorine electrodes, accumulated 1000 charge-discharge cycles. The operation of the 1.7 kW h system depends upon a network of peripheral components that comprise four subsystems: (1) the electrolyte loop; (2) the chlorine gas loop; (3) the hydrogen recombination loop; and (4) the hydrate storage and decomposition loop. The system has attained 40% of the cycle life target for a commercial load-leveling battery. Over one-half year of operation or 138 cycles without electrolyte maintenance have been achieved to date. Internal inspection of the cell and examination of electrode voltage data indicate that the chlorine electrodes have remained stable and that the goal of 2500 cycles will be reached.

N82-10503*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio

EFFECT OF POSITIVE PULSE CHARGE WAVEFORMS ON THE ENERGY EFFICIENCY OF LEAD-ACID TRACTION **CELLS Final Report**

John J Smithrick Sep. 1981 11 p refs (Contract DE-AI01-77CS-51044)

(NASA-TM-82709, E-991, DOE/NASA/51044-22) Avail NTIS HC A02/MF A01 CSCL 10A

The effects of four different charge methods on the energy conversion efficiency of 300 ampere hour lead acid traction cells were investigated. Three of the methods were positive pulse charge waveforms, the fourth, a constant current method, was used as a baseline of comparison. The positive pulse charge waveforms were 120 Hz full wave rectified sinusoidal, 120 Hz silicon controlled rectified, and 1 kHz square wave. The constant current charger was set at the time average pulse current of each pulse waveform, which was 150 amps. The energy efficiency does not include charger losses. The lead acid traction cells were charged to 70 percent of rated ampere hour capacity in each case The results of charging the cells using the three different pulse charge waveforms indicate there was no significant difference in energy conversion efficiency when compared to constant current charging at the time average pulse current

N82-10508# California Univ. Livermore Lawrence Livermore Lab **MECHANICAL ENERGY STORAGE TECHNOLOGY PROJECT**

Annual Report, 1980 T M Barlow, W T Crothers, T T Chiao, D N Frank, D M King, and S V Kulkarni 1 May 1981 203 p refs

(Contract W-7405-eng-48) (DE81-029753: **ÜCRL-50056-80**)

NTIS

HC A10/MF A01

Progress during 1980 in the development and evaluation of the energy-saving potential of flywheel energy storage systems for vehicles and for fixed-base power systems is reported. Activities related to transportation applications, fixed-base applications, fiber-composite materials technology, flywheel rotor and containment technology, advanced component technology, and project management are described

N82-10525# Hibbing Public Utilities Commission, Minn FEASIBILITY OF A SMALL SCALE PUMPED STORAGE DEMONSTRATION PROJECT, HIBBING, MINNESOTA

1981 229 p refs Prepared in cooperation with Hansen (James) and Associates, Springfield, Vt.

(Contract DE-AC07-76ID-01570)

(DE81-028678, DOE/TIC-1028678, IDO-10097) Avail NTIS HC A11/MF A01

The economic and technical feasibility of developing a 5 to 15 MW pumped storage power plant was examined. The substitution of power from a pumped storage facility for the purchased peak power is advantageous because (1) the coal fired cogeneration plant operates with an improved heat rate, (2) numerous open pits from abandoned iron ore mines are available as reservoirs for pumped storage; and (3) the peaking power generated does not depend on petroleum fuel it is suggested that eight mine sites are suitable for pumped storage, oil fired peak power units should be avoided to improve the efficiency of the existing cogeneration, this is a nonpolluting form of power generation, and the development of small scale reversible pump/turbine units for commercial operation is DOE destrable

N82-10527# Acres American, Inc., Buffalo, NY PRELIMINARY DESIGN STUDY OF UNDERGROUND PUMPED HYDRO AND COMPRESSED-AIR ENERGY STORAGE IN HARD ROCK. VOLUME 1: EXECUTIVE **SUMMARY Final Report**

May 1981 111 p Sponsored in part by Electric Power Research Inst Prepared for Potomac Electric Power Company, Washington,

(Contract DE-AC02-77ET-28013, EPRI Proj 1081-1) (DE81-029440, EPRI-EM-1589-Vol-1, DOE/ET-5047/1) Avail NTIS HC A06/MF A01

A preliminary design study of water compensated Compressed Air Energy Storage (CAES) and Underground Pumped Hydroelectric (UPH) plants for siting in geological conditions suitable for hard rock excavations was performed. The study was divided

07 ENERGY STORAGE

into five primary tasks as follows: establishment of design criteria and analysis of impact on power system, selection of site and establishment of site characteristics, formulation of design approaches, assessment of environmental and safety aspects; and preparation of preliminary design of plant. The salient aspects considered and the conclusions reached during the consideration of the five primary tasks for both CAES and UPH are pre-

N82-10528# Acres American, Inc., Buffalo, N Y PRELIMINARY DESIGN STUDY OF UNDERGROUND PUMPED HYDRO AND COMPRESSED-AIR ENERGY STORAGE IN HARD ROCK. VOLUME 2: PROJECT DESIGN

CRITERIA: UPH Final Report
May 1981 185 p refs Sponsored in part by Electric Power
Research Inst Prepared for Potomac Electric Power Co.
Washington, D.C.

(Contract DE-AC02-77ET-28013, EPRI Proj 1081-1)

(DE81-028107, EPRI-EM-1589-Vol-2, DOE/ET-5047/2) Avail

NTIS HC A09/MF A01

The design criteria for an underground pumped hydroelectric (JPH) storage facility having a maximum generating capacity of 2000 MW and a storage capacity of 20,000 MWh at a nominal head of 5000 ft are documented. The UPH facility is a two step configuration with single stage reversible pump turbines, each step consisting of a 1000 MW plant at a nominal head of 2500 ft. Overall design criteria including operating requirements, civil/structural criteria, geotechnical criteria, mechanical criteria and electrical criteria are detailed. Specific requirements are given for the upper reservoir, intake/outlet structure, penstock and draft tubes, powerhouses, transformer galleries, intermediate reservoir, lower reservoir, shafts and hoists, switchyard and surface buildings The requirements for the power plant electrical and mechanical equipment, including pump turbine and motor generator units, are referred to Electrical design criteria are given to meet the requirements of two power houses located underground at different depths, but these criteria may not necessarily reflect PEPCO's current engineering practice. The criteria refer to a specific site and take into account the site investigation results. The design criteria given were used as the basis for the plant desian

N82-10529# Acres American, Inc., Buffalo, NY
PRELIMINARY DESIGN STUDY OF UNDERGROUND PUMPED HYDRO AND COMPRESSED-AIR ENERGY STORAGE IN HARD ROCK. VOLUME 5: SITE SELECTION **Final Report**

Apr 1981 148 p refs Sponsored in part by Electric Power Research Inst Prepared for Potomac Electric Power Co., Washington, D.C.

(Contract DE-AC02-77ET-28013, EPRI Proj 1081-1)

(DE81-028199, EPRI-EM-1589-Vol-5, DOE/ET-5047/5) Avail NTIS HC A07/MF A01

A six-step site selection process undertaken to identify and subsequently rank potential sites suitable for either an underground pumped hydroelectric (UPH) facility, or a water-compensated hard-rock cavern compressed air energy storage (CAES) facility is described The region of study was confined to the service area of the Potomac Electric Power Company (PEPCO) and contiguous areas. Overriding considerations related to geology, environmental impact and transmission-line routing were studies within the context of minimizing plant costs. The selection process led to the identification of several sites suitable for the development of either a CAES or an UPH facility Design development and site exploration at the selected site are described DOE

N82-10530# Acres American, Inc., Columbia, Md PRELIMINARY DESIGN STUDY OF UNDERGROUND PUMPED HYDRO AND COMPRESSED-AIR ENERGY STORAGE IN HARD ROCK. VOLUME 9: DESIGN APPROACHES, CAES. APPENDIX D: MECHANICAL SYSTEMS Final Report

Apr 1981 104 p Sponsored in part by Electric Power Research Inst Prepared for Potomac Electric Power Company, Washington,

(Contract DE-AC02-77ET-28013, EPRI Proj. 1081-1) (DE81-028200, EPRI-EM-1589-Vol-9-App-D. DOE/ET-5047/9D) Avail: NTIS HC A06/MF A01

The development of the design approach taken for the mechanical systems included in a compressed air energy storage (CAES) facility were documented. Design approaches developed the fuel oil system, water supply system, waste treatment system, fire protection and safety system, and miscellaneous plant services are based on similar designs for conventional utility plants because the operating characteristics, design parameters, and equipment capabilities for CAES plant mechanical systems are similar to standard utility systems. The design approach for each of these systems develops several alternatives for achieving the CAES plant requirements in each area. The preferred alternative is then expanded into a preliminary system description

N82-10532# GeoTrans, Inc., Herndon, Va REVIEW OF SIMULATION TECHNIQUES FOR AQUIFER THERMAL ENERGY STORAGE (ATES)

James W Mercer, Charles R. Faust, William J Miller, and F J Pearson, Jr. Mar. 1981 225 p refs Prepared in cooperation with INTERA, Environmental Consultants, Inc., Houston, Texas Prepared for Pacific Northwest Lab., Richland, Washington (Contract DE-AC06-76RL-01830)

(DE81-029943, PNL-3769) Avail NTIS HC A10/MF A01 The analysis of aquifer thermal energy storage (ATES) systems rely on the results from mathematical and geochemical models Therefore, the state-of-the-art models relevant to ATES were reviewed and evaluated. These models describe important processes active in ATES including ground-water flow, heat transport (heat flow), solute transport (movement of contaminants), and geochemical reactions. In general, available models of the saturated ground-water environment are adequate to address most concerns associated with ATES, that is, design, operation, and environmental assessment in those cases where models are not adequate, development should be preceded by efforts to identify significant physical phenomena and relate model parameters to measurable quantities DOE

N82-10535# Brobeck (William M) and Associates, Berkeley, Calif

DYNAMIC STABILITY OF STACKED DISK TYPE FLY-WHEELS

F C Younger Apr. 1981 47 p refs Prepared for California Univ., Lawrence Livermore Lab (Contract W-7405-eng-48)

(DE81-030008; UCRL-15372) Avail NTIS HC A03/MF A01 A flywheel assembly formed from adhesively bonded stacked fiber composite disks was analyzed. The stiffness and rigidity of the assembly required to prevent unconrolled growth in the deformations due to centrifugal force was determined. It is shown that stacked disk type flywheels become unstable when the speed exceeds a critical value. This critical value of speed depends upon the stiffness of the bonded attachments between the disks It is found that elastomeric bonds do not provide adequate stiffness to insure dynamic stability for high speed stacked disk type flywheels.

N82-10540# Mitre Corp., McLean, Va Metrek Div STATUS OF THE DOE BATTERY AND ELECTROCHEMICAL TECHNOLOGY PROGRAM 2

R Roberts Dec 1980 279 p refs Presented at Dept. of Energy Battery and Electrochem Contractor's Conf., 10-12 Dec 1979

NTIS

(Contract DE-AC01-79ET-25407)

(DE81-029879, DOE/ET-25407/1) HC A13/MF A01

The status of electrochemical storage systems is reviewed. Secondary batteries were recommended, however, selected mechanically rechargeable batteries and aspects of energy conservation in industrial electrochemistry were included. Batteries included are: lead acid, nickel/iron, nickel/zinc; advanced: lithium/metal sulfide, sodium/sulfur, zinc/chlorine; and research and development metal/air, hydrogen/chlorine, zinc/bromine, redox, organic electrolytes, solid state. Electrode reactions, cell performance modeling, new battery materials are examined Energy conservation and alternative processes in electrochemical industry are reviewed. The potential contributions of the battery program to the various missions supported such as electric vehicles, photovoltaic systems, distributed electrical energy systems, and energy conservation in industry are discussed DOE

N82-10546# Potomac Electric Power Co., Washington, D.C. PRELIMINARY DESIGN STUDY OF UNDERGROUND PUMPED HYDRO AND COMPRESSED-AIR ENERGY STORAGE IN HARD ROCK. VOLUME 3: PROJECT DESIGN

CRITERIA: CAES Final Report

Apr 1981 218 p Prepared in cooperation with Acres American. Inc , Columbia, Md

(Contract DE-AC02-77ET-28013, EPRI Proj 1081-1) (DE81-028197. EPRI-EM-1589-Vol-3)

HC A10/MF A01

NTIS

NTIS

NTIS

The design criteria presented provided the basis for development of the design approaches and preliminary plant design. These design criteria are based, where possible, upon related facilities and experiences and are representative of normal utility practices. They cover the major plant equipment, systems, and facilities and the plant characteristics which depend upon or have an impact on plant surroundings. Project team studies and outside development contracts concentrated on those areas where current technology or practice does not provide adequate information to support plant design activities or economic analyses DOE

N82-10548# Midwest Research Inst., Golden, Colo Solar

Energy Research Inst
RAPID CHARGING OF LEAD-ACID BATTERIES FOR ELECTRIC-VEHICLE PROPULSION AND SOLAR-ELECTRIC STORAGE

P Longrigg Jun. 1981 44 p refs (Contracts EG-77-C-01-4042; DE-AC02-77CH-00178)

(DE81-028084. SERI/RR-742-1068) HC A03/MF A01

A survey of the various charging techniques that are available and that have been used extensively for lead acid batteries is presented Descriptions of newer techniques involving gas evolution controlled charging are also included. An evaluation of fast charge approaches, with an analysis of battery state equations. is presented

N82-10549# Oak Ridge Y-12 Plant, Tenn Fabrications Systems

COMPOSITE FLYWHEEL BALANCE EXPERIENCE
R. S. Steele 6 Apr 1981 9 p refs Presented at the IECEC

Conf. Atlanta, 9-14 Aug 1981 (Contract W-7405-eng-26)

(DE81-769341, Y/DX-290, CONF-810812-2) Avail, NTIS

HC A02/MF A01

The high performance composite flywheels which have properties useful in reducing the total energy requirements for automobiles were examined. This requires high rotational speeds and solution to the accompanying problems of fatigue and vibration control through balancing of the rotor Demonstrated that composite flywheels, require significant balancing and expenses to meet the minimum balance requirements practiced in industry Flywheels experience balance changes with speed changes DOE

N82-10556# Argonne National Lab , III

NEAR-TERM BATTERIES FOR ELECTRIC VEHICLES

C C Christianson, N P Yao, and F Hornstra 1981 9 p refs Presented at the 8th Energy Technol Conf and Expo, Washington, DC. 9-11 Mar 1981

(Contract W-31-109-eng-38)

(DE81-023543, CONF-810315-13) Avail

HC A02/MF A01

Major progress achieved in the lead-acid, nickel/iron and nickel/zinc battery technology development since the initiation of the Near-Term eV Battery Project in 1978 is reported Against the specific energy goal of 56 wh/kg the demonstrated specific energies are 41 wh/kg for the improved lead-acid batteries, 48 wh/kg for the improved nickel/iron batteries, and 68 wh/kg for the improved nickel/zinc batteries. These specific energy values would allow an ETV-1 vehicle to have an urban range of 80 miles in the case of the improved lead-acid batteries, 96 miles for the improved nickel/zinc batteries, and 138 miles for the improved lead-acid batteries. All represent a significant improvement over the state-of-the-art lead-acid battery capability of about 30 wh/kg with approximately a 51 mile urban range for the ETV-1 vehicle DOF

N82-10557# Argonne National Lab , III Chemical Engineering

RECENT PROGRESS IN LITHIUM, IRON SULFIDE BATTERY DEVELOPMENT

D L Barney, R K Steunenberg, and A A Chilenskes 1980 28 p refs Presented at the 15th Intersoc Energy Conversion Eng Conf., Seattle, 18-22 Aug 1980 (Contract W-31-109-eng-38)

(DE81-023127 CONF-800806-46)

HC A03/MF A01

NTIS

The development of high temperature lithium/iron sulfide batteries for electric vehicle propulsion and stationary energy storage is described. In the Mark 2 program, various improvements are made in the cells and battery hardware to eliminate the potential failure mechanisms in the cell development effort, multiplate cells with three positive and four negative electrodes were fabricated A charger equilizer concept is developed, in which the major portion of the charge is added to the battery as a whole and then the individual cells are charged to a predetermined cutoff voltage DOE

N82-10574# Acres American, Inc., Columbia, Md · PRELIMINARY DESIGN STUDY OF UNDERGROUND PUMPED HYDRO AND COMPRESSED-AIR ENERGY STORAGE IN HARD ROCK. VOLUME 12: PLANT DESIGN, **CAES** Final Report

Apr. 1981 285 p Sponsored in part by Electric Power Research Inst Prepared for Potomac Electric Power Company, Washington, D.C.

(Contract DE-ACO2-77ET-28013, EPRI Proj 1081-1)

(DE81-028110, EPRI-EM-1589-Vol-12: DOE/ET-5047/12) Avail NTIS HC A13/MF A01

Detailed designs were developed for the major components and systems of the CAES plant. These designs were based upon the preliminary economic and technical evaluations and alternative designs developed in Task 3C. The detailed project design drawings for the major plant systems and structures are presented. The site development report, updated cost estimate, cost/schedule risk study, reliability/availability, analysis, and recommendations for additional research and development are included

N82-10962# Argonne National Lab , III
STATUS OF NICKEL/ZINC AND NICKEL/FRON BATTERY

TECHNOLOGY FOR ELECTRIC VEHICLE APPLICATIONS N P Yao, C. C Christianson, R C Elliott, and J F Miller 1980 43 p refs Presented at the 29th Power Sources Conf. Cherry Hill, NJ, 10-13 Jun 1980

(Contract W-31-109-eng-38)

CONF-800612-6) DE81-023572.

HC A03/MF. A01

Progress in nickel/zinc and nickel/iron technology was to achieve battery technical performance goals necessary for widespread use in electric vehicle applications is reviewed Nickel/zinc module test data show a specific energy of nearly

Avail

NTIS

70 Whr/kg and a specific power of 130 W/kg Nickel/iron moduls demonstrate a specific energy of nearly 50 Wh/kg and a specific power of 100 W/kg Energy efficiency is improved from less than 50 percent to over 65 percent. Cost reduction is emphasized in the development of both nickel/zinc and nickel/iron batteries to achieve the lowest possible life cycle cost to the battery user

N82-11368# Brookhaven National Lab , Upton, N Y of Energy and Environment

INVESTIGATION OF THE ZINC ELECTRODE REACTION Annual Report, 1 Oct. 1979 - 30 Sep. 1980

James McBreen Dec 1980 138 p refs (Contract DE-AC02-76CH-00016)

(DE81-030221, BNL-51370) Avail NTIS HC A07/MF A01

In nickel-zinc batteries, with pasted zinc electrodes, zinc electrode shape change or redistribution of the active material from the edge of the electrodes toward the center is the major life-limiting factor. In batteries with soluble free electrolyte zinc electrodes, morphology changes, particularly under random cycling conditions, is a major operational problem. Insights and possible solutions to these two problems are considered. The areas covered include. (1) additive and substrate effects on zinc electrode morphology: (2) investigations of zinc electrodes of the second kind, (3) separator effects on zinc electrode shape change, and (4) investigation of the effect of modified charging methods on the morphology and behavior of both pasted and soluble free electrolyte zinc electrodes

N82-11547*# Munising Paper Div , Neenah, Wis DEVELOPMENT OF BATTERY SEPARATOR COMPOSITES Final Report, Oct. 1976 - Nov. 1981 George F Schmidt and Robert E Weber Nov 1981 56 p

07 ENERGY STORAGE

refs (Contract NAS3-20583) (NASA-CR-165508) Avail NTIS Hc A04/MF A01 CSCL 10C

Improved inorganic-organic separators developed by NASA were commercially prepared A single-ply asbestos substrate was developed, as well as alternative substrates based on cellulose and on polypropylene fibers. The single-ply asbestos was bound with butyl rubber and was functionally superior to the formerly used polyphenylene oxide saturated sheet. Commercially prepared separators exhibited better measured separator properties than the NASA standard. Cycle life in Ni/Zn and Ag/Zn cells was related to substrate, decreasing in the order, asbestos > cellulose paper > nonwoven polypropylene. The cycle life of solvent-coated separators was better than aqueous in Ni/Zn cells, while aqueous coatings were better in Ag/Zn cells.

N82-11578# Argonne National Lab , III Chemical Engineering Div

CALCIUM/METAL SULFIDE BATTERY DEVELOPMENT PROGRAM Progress Report, Oct. 1979 - Sep. 1980

D L Barney, M F Roche, S K Preto, L E Ross, N C Otto, and F J Martino Mar. 1981 24 p refs Prepared for California Univ., Lawrence Berkeley Lab (Contract W-31-109-eng-38)

(ANL-81-14) Avail NTIS HC A02/MF A01

Components needed to fabricate a high performance calcium cell were identified. The components are (1) Ca-Al-Si negative electrode, (2) Fe sub 0.93 Co sub 0.075 sub 2 positive electrode, (3) Bn felt separator, (4) iron negative and molybdenum positive current collectors, and (5) LiG-NaCl-CaCl2-BaCl2 electrolyte

EAK

N82-11580# Varta Batterie A.G., Kelkheim (West Germany) RECENT ADVANCES IN LEAD-ACID CELL RESEARCH AND DEVELOPMENT

Ernst Voss 1980 38 p refs Presented at the EVA Conf, Adelia, Australia, 25-29 Aug 1980 Sponsored in part by Bundesministerium fuer Forschung und Technologie Prepared for Argonne National Lab. III

(Contract W-31-109-eng-38)

(DE81-023104, CONF-8008118-1) Avail NTIS HC A03/MF A01

During the last decade it was demonstate that the lead-acid system is capable of proving an attractive energy source of sufficient energy and power per unit weight and volume which allows its successful application for electric vehicle propulsion. This is shown by a number of typical exemples, such as the relationship between active-material properties and capacity at high rates of discharge the effect of acid stratification and others. Simultaneously, the expenditure for the maintenance of lead-acid batteries was minimized by the development of peripheric equipment, as there are means for central-automatic water refill and recombination devices. It is shown that there is still a considerable potential for further improvement which might again strengthen the unique position of the lead-acid system in the market in comparison to competitive systems.

N82-11594# California Univ. Berkeley. Lawrence Berkeley

OVERVIEW OF THE APPLIED BATTERY AND ELECTRO-CHEMICAL RESEARCH PROGRAM

F McLarnon Jun 1981 15 p Presented at the 4th DOE Battery and Electrochem. Contractors' Conf., Washington, D.C., 2 Jun 1981

(DE81-027397; LBL-12690; CONF-810642-5) Avail. NTIS HC A02/MF A01

This purpose of this program is to provide the applied research base which supports all of DOE's electrochemical systems missions, and the general objective is to help provide batteries and electrochemical systems that can satisfy economic, performance and schedule requirements. The specific goal is to identify the most promising electrochemical technologies and transfer them to industry and/or another DOE program for further development and scale-up.

N82-11595# California Univ., Berkeley. Lawrence Berkeley Lab

RECHARGEABLE MOLTEN-SALT CELLS

Elton J Cairns Oct 1980 23 p refs Presented at the 158th

Meeting of the Electrochem Soc , 3rd Intern Symp on Molten Salts, Phys Electrochem Div , Hollywood, Fla , 5-10 Oct 1980 (Contract W-7405-eng-48)

(DE81-027091, LBL-11090, CONF-8010159-12) Avail NTIS HC A02/MF A01

Rechargeable molten-salt cells offer the opportunity for achieving higher specific energy than is available from ambient temperature cells (200 W-h/kg), and a specific power in excess of 100 W/kg. Two main of rechargeable cells employing molten salts are statistical those with a molten salt as the sole electrolyte, and those with a combination of a solid electrolyte and a molten salt electrolyte. The status, recent research, and current problems for each of several systems in the above two categories are discussed.

N82-11596# California Univ , Livermore Lawrence Livermore Lab

MECHANICAL ENERGY STORAGE TECHNOLOGY (MEST) DEVELOPMENT

Thomas M. Barlow 22 Jun 1981 8 p refs Presented at the Mech., Magnetic, and Underground Energy Storage Ann Contractors' Rev., Washington, D.C., 24-26 Aug 1981 (Contract W-7405-eng-48)

(DE81-026800, UCRL-86297) Avail NTIS HC A02/MF A01
The objectives, approaches, structure, and principal accomplishments of the flywheel technology program during FY 1981
are summarized International flywheel-related technology and complementary efforts in the United States are reviewed DOE

N82-11620# Potomac Electric Power Co., Washington, D.C. PRELIMINARY DESIGN STUDY OF UNDERGROUND PUMPED HYDRO AND COMPRESSED-AIR ENERGY STORAGE IN HARD ROCK. VOLUME 8: DESIGN APPROACHES: UPH Final Report

Jun 1981 297 p Prepared in cooperation with Acres American, Inc., Buffalo, N.Y. Sponsored in part by Electric Power Research Inst.

(Contract DE-AC02-77ET-28013, EPRI Proj 1081-1)

(DE81-030673, EPRI-EM-1589-Vol-8) Avail NTIS HC A11/MF A01

The development of the design approaches used to determine the plant and overall layout for a underground pumped hydroelectric (UPH) storage facility having a maximum generating capacity of 2000 MW and a storage capacity of 20,000 MWh is discussed Key factors were the selection of the high head pump-turbine equipment and the geotechnical considerations relevant to the underground cavern designs. The comparison of pump-turbine alternatives is described leading to the selection for detailed study of both a single-step configurations, using multistage reversible pump-turbines, and a two-step configuration, with single-stage reversible pump-turbines.

N82-11621# Potomac Electric Power Co., Washington, D.C. PRELIMINARY DESIGN STUDY OF UNDERGROUND PUMPED HYDRO AND COMPRESSED-AIR ENERGY STORAGE IN HARD ROCK. VOLUME 9: DESIGN APPROACHES: CAES, APPENDIX C. MAJOR MECHANICAL EQUIPMENT Final Report

Apr 1981 108 p refs Prepared in cooperation with Acres American, Inc., Columbia. Md Sponsored in part by Electric Power Research Inst

(Contract DE-AC02-77ET-28013, EPRI Proj 1081-1) (DE81-030672, EPRI-EM-1589-Vol-9-App-C) Avail NTIS

(DE81-030672, EPRI-EM-1589-Voi-9-App-C) Avail HC A08/MF A01

The major mechanical equipment includes the turbine-motor/generator, compressor train, intercooler/aftercooler system, and exhaust gas recuperator. The design criteria for each of these components is interrelated with, and dependent upon, each of the other components within the major mechanical equipment group. Careful consideration of this dependency has resulted in an overall design approach which satisfies the requirements of the CAES operational cycle while providing for a conservative component design.

NB2-11997# Aerospace Corp., Los Angeles, Calif ASSESSMENT OF FLYWHEEL SYSTEM BENEFITS IN SELECTED VEHICLE APPLICATIONS

L H Kubo and L. Forrest 1981 7 p refs Presented at IECEC Conf., 9 Aug. 1981 (Contract DE-AC08-79ET-26306)

(DE81-025976. CONF-810812-31) NTIS Avail HC A02/MF A01

The performance of vehicle systems incorporating energy storage flywheels was investigated. The effort involved an indept assessment of flywheel system benefits in two vehicle applications a four-passenger commuter car with electric drive (flywheel range extension application) and a six-passenger family car with conventional heat engine drive (flywheel fuel conservation application) The special case of the six-passenger vehicle as used in taxicab service was also investigated. A number of possible component design/selection alternatives for flywheel rotors, continuously variable transmissions, batteries, motors, and other propulsion elements were examined Results of the assessment are provided for the case of a series-configuration heat engine/ flywheel drive train as used in the passenger car and urban taxi vehicle missions

N82-12396# California Univ., Berkeley Lawrence Berkeley Lab Earth Sciences Div

STUDY OF ATES THERMAL BEHAVIOR USING A STEADY FLOW MODEL

Christine Doughty, Goeran Hellstroem, Chin Fu Tsang, and Johan Claesson (Lund Inst of Tech.) Jan 1981 79 p refs (Contract W-7405-eng-48)

(DE81-030883, LBL-11029, PNL-3924) HC A05/MF A01

The thermal behavior of a single well aquifer thermal energy storage system in which buoyancy flow is neglected is studied A dimensionless formulation of the energy transport equations for the aquifer system is presented, and the key dimensionless parameters are discussed A simple numerical model is used to generate graphs showing the thermal behavior of the system as a function of these parameters. Some comparisons with field experiments are given to illustrate the use of the dimensionless groups and graphs

N82-12445*# Bales-McCoin Tractionmatic, Inc., El Paso, Tex DESIGN STUDY OF A CONTINUOUSLY VARIABLE ROLLER CONE TRACTION CVT FOR ELECTRIC VEHICLES Final Report

Dan K McCoin and R D. Walker Sep 1980 197 p refs (Contract DEN3-115, EC-77-A-31-1044)

(NASA-CR-159841, DOE/NASA/0115-80/1,

Bales-McCoin-80-BMT-002) Avail NTIS HC A09/MF A01

Continuously variable ratio transmissions (CVT) featuring cone and roller traction elements and computerized controls are studied The CVT meets or exceeds all requirements set forth in the design criteria. Further, a scalability analysis indicates the basic concept is applicable to lower and higher power units, with upward scaling for increased power being more readily ac-

N82-12574*# National Aeronautics and Space Administration

Lewis Research Center, Cleveland, Ohio
PERFORMANCE OF ADVANCED CHROMIUM ELECTRODES FOR THE NASA REDOX ENERGY STORAGE **SYSTEM Final Report**

Randall F Gahn, JoAnn Charleston, Jerri S Ling, and Margaret A. Reid Nov 1981 23 p refs (Contract DE-AIO4-8OAL-12726)

(NASA-TM-82724; E-1025; DOE/NASA/12726-15) Avail. NTIS HC A02/MF A01 CSCL 10C

Chromium electrodes were prepared for the NASA Redox Storage System with meet the performance requirements for solar-photovoltaic, wind-turbine and electric utility applications Gold-lead catalyzed carbon felt electrodes up tp 930 sq cm were fabricated and tested in single cells and multicell stacks for hydrogen evolution, coulombic efficiency, catalyst stability and electrochemical activity. Factors which affect the overall performance of a particular electrode include the carbon felt lot. the cleaning treatment and the gold catalyzation method. Effects of the chromium solution chemistry and impurities on charge/ discharge performance are also presented

N82-12586# Battelle Pacific Northwest Labs , Richland, Wash BIBLIOGRAPHY OF THE SEASONAL THERMAL ENERGY STORAGE LIBRARY

L S Prater, G Casper (Midwest Research Inst.), and R A Kawin (Control Data Corp.) Aug 1981 310 p

(Contract DE-AC06-76RL-01830)

(DE81-030470, PNL-3645) Avail NTIS HC A14/MF A01 Seasonal storage of thermal energy which contributes to the relief of the national energy storage is described Various forms of surplus energy (winter chill, summer heat, and industrial waste heat) are stored till needed. Potential storage media include aquifers, lakes, ponds, and earth. Storage of thermal energy in aguifers is chosen for initial development. Other methods of seasonal storage are also evaluated

N82-13377 Purdue Univ , Lafayette, Ind APPLICATION OF A GRAVITY-DRIVEN WICKLESS HEAT PIPE FOR ICE PRODUCTION IN A COLD ENERGY STORAGE SYSTEM Ph.D. Thesis

Shun-Lung Chao 1981 255 p

Avail Univ Microfilms Order No 8123621

Use of seasonal cold storage for space cooling is considered A simplified analytical model, simulated by a computer program, was developed to predict the system performance Experiments were performed to study the effects of various parameters on the ice formation. Parameters studied include the quantity of working fluid, condenser length, coolant inlet temperature, cooling time, type of working fluid, and inclination of the heat pipe. The effects of these parameters on the volume and shape of the resulting ice formation and on the wall temperature distribution along the heat pipe are illustrated Evaporation and condensation phenomena within the heat pipe were investigated. The influence of natural convection on the geometry and structure of the ice is also discussed. The analytical model was found to be adequate for predicting the rate of ice formation and the geometry associated with the ice-water interface, and was verified by comparisons with experimental observations

N82-13544# Public Service Co of Indiana, Plainfield COMPRESSED AIR ENERGY STORAGE: PRELIMINARY DESIGN AND SITE DEVELOPMENT PROGRAM IN AN AQUIFER. VOLUME 2: UTILITY SYSTEM PLANNING Final Report

31 Jul 1981 112 p refs Sponsored in part by EPRI (Contracts DE-AC02-78ET-29232, ET-78-C-01-2159, EPRI Proj 1081-3)

(DE82-000466. DOE/ET-29232/T4-Vol-2) HC A06/MF A01

The performance of an aquifer compressed air energy storage system was studied. The benefits derived from the integration of a compressed air energy storage facility with a hypothetical electrical network are analyzed Scenarios of 100 percent coal. 50 percent coal and 50 percent nuclear, and 100 percent nuclear base load capacity additions were examined Favorable economics are indicated when compressed air energy storage is installed as an alternative to combustion turbine peaking capacity on a system with a significant amount of oil fired generation

N82-14652# Battelle Pacific Northwest Labs , Richland, Wash Office of Seasonal Thermal Energy Storage Program WASTE HEAT AND CHILL STORAGE IN AQUIFER

SYSTEMS Jay R Eliason 1981 10 p refs Presented at the 3rd Conf on Waste Heat Management and Utilization, Miami, Fla. 12 May

1981 (Contract DE-AC06-76RL-01830)

(DE81-028016, PNL-SA-9164, CONF-810545-6) Avail NTIS HC A02/MF A01

Seasonal storage of thermal energy in aquifers is discussed Winter chill, summer heat, and various forms of industrial waste heat and chill can be stored for future demand, reducing the need for generating primary energy. This seasonal storage of heat and chill in aquifer systems is assessed

N82-14655# California Univ , Livermore Lawrence Livermore Lah

FLYWHEEL ROTOR AND CONTAINMENT TECHNOLOGY DEVELOPMENT

S V Kulkarnı 11 Aug 1981 14 p refs Presented at the Mech , Magnetic, and Underground Energy Storage 1981 Ann Contractors' Rev Meeting, Washington, D.C. 24-27 Aug 1981 (Contract W-7405-eng-48)

(DE81-028047, UCRL-86557, CONF-810833-7) Avail NTIS

HC A02/MF A01

07 ENERGY STORAGE

An economical and practical composite flywheel with an energy density of 88 Wh/kg at failure, an operational energy density of 44 to 55 Wh/kg, and an energy storage capacity of approximately 1 kWh was developed. The suitability of various manufacturing processes for low cost rotor fabrication is determined, flywheel and flywheel systems dynamics are investigated. Prototype rotors for use in transportation and stationary applications and a fail safe, lightweight, and low cost flywheel containment are evaluated.

N82-15510# Battelle Pacific Northwest Labs , Richland, Wash RESERVOIR STABILITY STUDIES

T J Doherty Jul 1981 9 p refs Presented at Mech Magnetic and Energy 1981 Ann Contractors Review Meeting, Washington, D C . 24 Aug 1981

(Contract DE-AC06-76RL-01830)

(DE81-030099, PNL-SA-9782; CONF-810833-9) Avail NTIS HC A02/MF A01

Stability criteria for large underground reservoirs in salt domes, hard rock caverns, and porous rock structures for air storage in utility applications were studied Reservoir stability commercialization of compressed air energy storage (CAES) systems was emphasized A state-of-the-art assessment, numerical model development and experimental studies culminating in field research, was formulated. Site specific geotechnical design evaluations using methodologies to assess hard rock carvem stability, implementation of in-mine research on the response of domal salt, integrated laboratory and field study facilities to assess developed predictive methods and determine in situ response of a porous media reservoir to air injection are completed.

N82-15548# Battelle Pacific Northwest Labs, Richland, Wash. COMPRESSED-AIR ENERGY-STORAGE TECHNOLOGY: PROGRAM OVERVIEW

L D Kannberg Jul. 1981 7 p Presented at the Mech., Magnetic and Underground Energy Storage Ann. Contractor's Rev. Meeting, Washington, D C, 24 Aug 1981 (Contract DE-AC06-78RL-01830)

(DE81-030103, PNL-SA-9780; CONF-810833-8) Avail: NTIS

HC A02/MF A01

A new technology designed to reduce the consumption of oil in the generation of electric power was developed. The program has two major elements reservoir stability studies and second generation concepts studies. The reservoir stability studies are simed at developing stability criteria for long term operation of large underground reservoirs used for compressed air storage. The second generation concepts studies are aimed at developing new concepts that will require little or no petroleum fuels for operation. The program efforts are outlined and major accomplishments towards the objectives of the program are identified.

N82-15558# Midwest Research Inst., Golden, Colo Solar Energy Research Inst

DESIGN AND ECONOMICS OF DIRECT-CONTACT SALT HYDRATE STORAGE SYSTEMS

John D Wright May 1981 9 p refs Presented at the 2nd World Congr of Chem Eng., Montreal, 4-9 October 1981 (Contract EG-77-C-01-4042)

(SERI/TP-631-1163. CONF-811007-3) Avail NTIS HC A02/MF A01

A salt hydrate latent heat storage system in which oil is injected at the bottom of the container and exhanges heat as it floats to the top where it is pumped back to the heat source is described. Two experiments are described (1) to reliably inject the oil into the salt phase, and (2) to minimize the carryover of salt hydrate into the oil, which can be done using two stage coalescer filters. Three systems are described and compared, a standard liquid based sensible heat storage system, a latent heat storage design where oil is the heat transfer fluid throughout the system, and a latent heat storage system where ethylene glycol/water is used in the collectors and oil in the storage tank.

N82-15579# Ames Lab, lowa
TRANSWALL: A MODULAR VISUALLY TRANSMITTING
THERMAL STORAGE WALL Status Report

J F. McClelland, R W Mercer, L. Hodges, R F Szydlowski, P H Sidles, R G Struss, J. R Hull (Argonne National Lab , III),

and D A Block 1980 8 p refs Presented at the Intern Solar Energy Soc Conf , Brighton, England, 24-27 Aug 1980 (Contract W-7405-eng-82)

(DE81-029821: IS-M-345, CONF-8008123-1) Avail NTIS HC A02/MF A01

The Transwall a semitransparent thermal storage wall system that offers a number of advantages over conventional direct gain and Trombe wall approaches is examined Progress is reported in the design, fabrication, installation, and operation of a glass and aluminum prototype system. A facility for year round performance testing of the system is described and preliminary summer season thermal test data are presented. Thermal performance modeling results that predict heat loss reduction with a heat mirror coating on Transwall to be comparable to that obtained with R6 night insulation are reported.

N82-15584# Institut fuer Kemtechnik und Energiewandlung e.V., Stuttgart (West Germany).

DEVELOPMENT OF A MODULAR HEAT EXCHANGER WITH INTEGRATED LATENT HEAT ENERGY STORE Final Report, Dec. 1979.

Ashok Abhat, Dietmar Heine, Manfred Heinisch, Nikolaus A Malatidis, and Guenther Neuer Bonn Bundesministerium fuer Forschung und Technologie Feb by Bundesministerium fuer Forschung und Technologie

(Contract BMFT-PLE-ET-4060-A)

(BMFT-FB-T-81-050, ISSN-0340-7608) Avail NTIS HC A11/MF A01, Fachinformationszentrum, Karlsruhe, West Germany DM 41,10

Latent heat storage materials and appropriate heat exchangers for solar heating applications, such as house heating and domestic hot water production were investigated. The melting and freezing characteristics and the effects of thermal cycling on a total of 12 substances, including paraffins, fatty acids and salt hydrates, were investigated and their corrosive interaction with five conventional construction materials was determined. The poor thermal conductivity of the heat storage materials requires the development of a modular finned heat pipe heat exchanger with increased heat transfer characteristics. A cost analysis is provided and comparisons with hot water storage indicate that latent heat storage has the potential of becoming economically more attractive than the former for domestic hot water production.

08 GENERAL

A82-15377 Research opportunities in new energy-related materials. J. L. Warren (Los Alamos National Laboratory, Los Alamos, NM) and T. H. Geballe (Stanford University, Stanford, CA). Materials Science and Engineering, vol. 50, Oct. 1981, p. 149-198. 235 rets. Hesearch supported by the U.S. Department of Energy.

The needs and opportunities in basic research on new materials are reviewed with a view to providing a basis for planning future research programs. The review covers polymers, intermetallic compounds, amorphous solids, thin films, solid state ionics, catalysts, and semiconductors. It is concluded that (1) a large number of new materials can be prepared by imaginative application of established techniques, (2) a close coupling of synthesis, characterization, and measurement of properties is essential, and (3) new phases of well-known materials, e.g. amorphous materials and thin films, provide a better understanding of these materials and promise solutions to a number of technical problems.

A82-17251 Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2. Conference supported by the Energy Research, Inc , High Vacuum Equipment Corp., Kinney Vacuum Co., et al. Edited by J. N. Zemel. Lausanne, Elsevier Sequoia, S.A., 1980 Vol. 1, 567 p., vol. 2, 510 p. Price of two volumes, \$129.75.

Among the topics discussed are. (1) metallurgical coatings for solar energy applications, such as highly reflecting molybdenum thin films, the nucleation and growth characteristics of zinc oxide overgrowths, and the oxidation of electrodeposited black chromium selective solar films, (2) the characterization of coating defects, including aluminum film vapors deposited onto plastic, plasmasprayed ferrous alloys, and chemisorption monolayer coatings; (3) metal and alloy coatings, among which are those of tungstate on tin, molybdenum on graphite, aluminum-zinc coatings for the corrosion protection of steel and aluminum-silver alloy films for solar reflectors, (4) metallurgical aspects of microelectronics, including recent advances in solder bond technology for microelectronic packaging, (5) semiconductor and dielectric coatings, and (6) refractory compound coatings

N82-10565# Midwest Research Inst., Golden, Colo Solar Energy Research Inst

MEASURED PERFORMANCE OF FALLING-JET FLASH EVAPORATORS

H J Green, D A Olson, D Bharathan, and D H. Johnson Jun 1981 9 p refs Presented at the 8th Ocean Energy Conf. Washington, D C, 7 Jun 1981 (Contract EG-77-C-01-4042)

(DE81-024355, SERI/TP-631-1270, CONF-810622-3) Avail NTIS HC A02/MF A01

The rates of heat transfer and approach to thermal equilibrium of flash evaporators operating at pressures of 2 to 4 kPa were investigated. Heat and mass transfer rates from falling jet evaporators operating in the temperature range of 18 to 30 C are measured. The initial experimental results are given and the apparatus is described.

N82-11012# Ames Lab., lows AMES LABORATORY RESEARCH REPORT, 1980 1980 100 p

(Contract W-7405-eng-82) (DE81-027399, IS-4767) Avail NTIS HC A05/MF A01

Some of the research activities at Ames Laboratory described include coal research, solar cells, solar space heating of buildings, superconducting wires, coal carcinogens, lasers, solid waste recovery, nuclear physics, and high energy physics Publications are listed DOE

N82-14649# California Univ , Livermore Lawrence Livermore Lab

FIRE-PROTECTION RESEARCH FOR ENERGY TECHNOLOGY: FY 80 YEAR END REPORT

H K Hasegawa, N J Alvares, A E Lipska, H Ford, S Priante, and D G Beason 26 May 1981 118 p refs (Contract W-7405-eng-48)

(DE82-000970, UCRL-53179) Avail NTIS HC A06/MF A01 This continuing research program was initiated in order to advance fire protection strategies for Fusion Energy Experiments (FEE) The program expanded to encompass other forms of energy research Accomplishments for fiscal year 1980 were finalization of the fault-free analysis of the Shiva fire management system. development of a second-generation, fire-growth analysis using an alternate model and new LLNL combustion dynamics data. improvements of techniques for chemical smoke aerosol analysis. development and test of a simple method to assess the corrosive potential of smoke aerosols, development of an initial aerosol dilution system, completion of primary small-scale tests for measurements of the dynamics of cable fires, finalization of primary survey format for non-LLNL energy technology facilities; and studies of fire dynamics and aerosol production from electrical insulation and computer tape cassettes

N82-14981# Strasbourg Univ (France) Bureau d'Economie Theorique et Appliquee

ECONOMIC EFFECTS INDUCED BY ESA CONTRACTS, PHASE 2. VOLUME 1: SUMMARY [LES EFFETS ECONOMIQUES INDUITS DES CONTRATS DE L'ESA. PHASE 2. VOLUME 1: RESUME]

Patrice Brendle, Patrick Cohendet, Jean-Alain Heraud, Regis LaruedeTournemine, Helwig Schmied, Daniel Vitry, and Ehud Zuscovitch Paris ESA Jun 1980 22 p in FRENCH 3 Vol (Contract ESA-3702/78/F-DKR(SC)) (ESA-CR(P)-1462-Vol-1) Avail NTIS HC A02/MF A01

Different effects are classified by technological advantages, commercial gains, organization and methodological advances, and impact on employment Exports and limiting, or substitution for, imports are considered Advantages other than space research were estimated for each sector of the economy and by country. Project Meteosat is shown to be of particular value Results show that innovations due to ESA funding center on two essential activities processing, storage and dissemination of information, and conditioning, storage and distribution of energy

Author (ESA)

N82-15008* National Aeronautics and Space Administration, Washington, D C

HIGHLIGHTS OF 1981 ACTIVITIES

23 Dec 1981 20 p

(NASA-News-Release-81-199, P81-10203) Avail NTIS Avail NASA Scientific and Technical Information Facility, P O Box 8757, B W I Airport, Md 21240 CSCL 22B

The highlights of NASA's 1981 activities are presented, including the results of the two flights of the space shuttle Columbia and the Voyager 2 encounter with Saturn Accomplishments in the areas of space transportation operations, space science, aeronautical, energy, and space research and development, as well as space tracking, international activities, and 1981 launch activities are discussed

N82-15436# National Bureau of Standards, Washington, D C DIMENSIONS, VOLUME 65, NUMBER 3

Apr. 1981 29 p refs

(PB81-235053; NBS-DIM-65-3) Avail NTIS HC A03/MF A01 CSCL 14B

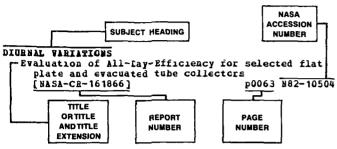
This monthly magazine features short summaries of major technical developments, highlights of work in progress, major speeches and statements by Bureau management, and a listing of NBS publications. Topics discussed are issue swinging to the Earth's tilt, testing for technical competence, physics at the measurement limits, new parameter proposed for fracture toughness, evaluation of solar collector cover plates, and improved modeling of cement and concrete, fire development in basement rooms, and generation and measurement of DC electric field with space charges.

SUBJECT INDEX

ENERGY / A Continuing Bibliography (Issue 33)

APRIL 1982

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title, and title extension if used, provides the user with a brief description of the subject matter. The report number helps to indicate the type of document cited (e.g., NASA report, translation, NASA contractor report). The page and accession numbers are located beneath and to the right of the title Under any subject heading the accession numbers are arranged in sequence with the AIAA accession numbers appearing first

ABERRATION

Chromatic aberration effect on sciar energy

systems using Fresnel lenses p0052 A82-13284

ABSORBENTS

Cycle and performance analysis of absorption heat numps for waste heat utilization

[DE81-030705] Geothermal environmental assessment: Behavior of

selected geothermal brine contaminants in plants and soils

[PB81-222333]

p0015 N82-11671

ABSORPTANCE

An integrating sphere based on absolute method for measuring sclar absorptance

p0058 A82-16247 Tertiary oil recovery processes research at the

University of Texas [DE81-025222]

p0096 N82-10477

ABSORPTION

Kinetics of reactions in a wet flue gas simultaneous desulfurization and denitrification system

[DE81-029853]

p0033 N82-15607

ABSORPTION COOLING

Comparison of concepts for solar-heated or solar-driven absorption and compression cooling machines for air conditioning and food

preservation purposes, phase 1 BMFT-FB-T-81-165]

p0080 N82-15541

Overview of active solar absorption/Rankine

cooling program [DE81-028041]

ABSORPTIVITY

Effect of metal base layer on the absorptance and emittance cf sputtered graded metal-carbon selective absorbing surfaces

p0040 A82-10469

Indian energy abstracts

p0032 N82-15591 [PB81-232316] ACCELERATED LIFE TESTS

Life-testing of 1.7 kW h zinc-chloride battery system - Cycles 1 - 1000

p0155 A82-18498

ACCESSORIES

Controlled Speed Accessory Drive demonstration

program

[NASA-CR-165010] p0026 N82-13981

ACCIDENT PREVENTION

Overview of the biomedical and environmental programs at the Oak Ridge National Laboratory [DE81-027864] p0021 N82-12765

Creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program,

[PB81-233918]

ACID RAIN

Preliminary study: Use of low-sulfur coal and coal cleaning in control of acid rain

p0021 N82-12675 [DE81-028930] Investigation of the application of remote sensing

technology to environmental monitoring p0030 N82-15488 [£82-10010]

ACTIVATED SLUDGE

Parallel evaluation of air-and oxygen-activated

sludge [PB81-246712]

D0034 N82-15633

ACTIVATION ENERGY

Zn3P2 as an improved semiconductor for photovoltaic solar cells p0069 N82-11577

F DE81-0255871 ACTIVITY (BIOLOGY)

Development of newer methods for the isolation and identification of certain components found in complex mixtures derived from energy sources and the determination of their biological activity

via bioassay systems [DE81-028311]

D0092 N82-10148

ADDITIVES

A protective additive for jet fuels

p0090 A82-12022

Field demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p01

p0115 N82-14522 Field demonstration of the conventional steam

drive process with ancillary materials [DE81-026962] p01 p0115 N82-14523

ARRORRS

Enhancement of methane gas production using an industrial waste in anaerobic digestion --- effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267

AERODYNAMIC CHARACTERISTICS

Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification

p0127 A82-12113

Analytical evaluation of the aerodynamic performance of a high-reliability vertical-axis wind turbine

An indoor blade test facility for determining the basic aerodynamic properties of Darrieus wind turbine airfoils with test results for an NACA 0015 and a modified section

The effect of rotor blade thickness and surface finish on the performance of a small axial flow

turbine

[NASA-TM-82726] AERODYNAMIC DRAG

p0141 N82-13114

A first order mathematical model of the lift/drag characteristics of aerofoll sections p0130 A82-14357

ABRODYNAMIC INTERPERENCE

Up- and down-wind rotor half interference model for VAWT --- Vertical Axis Wind Turbines p0129 A82-14031 [AIAA PAPER 81-2579]

AERODYNAMIC LOADS

A vertical axis cyclogiro type wind-turbine with freely-hinged blades

ARRODYNAMIC STABILITY SUBJECT INDEX

	ance for the	AIR CONDITIONING EQUIPMENT	
Darrieus wind turbines [AIAA PAPES 81-2582]	p0130 A82-14034	Alternative power sources for residential air-conditioning systems	
ABRODYNAMIC STABILITY	p0130 R02-14034	p0039	A82-10331
An aeroelastic analysis of the Darr	ieus Wind turbıne	Electric and hybrid vehicle environmental c	
[AIAA PAPER 81-2572]	p0129 A82-14029	subsystem study	NOO 40650
ABRODYNAMIC STALLING Analytical evaluation of the aerody	namıc	[NASA-CR-164996] p0020 Passive/hybrid solar components: An approa	N82-12658
performance of a high-reliability		standard thermal test methods	CE 10
wind turbine			N82-13549
	p0134 A82-17641	Comparison of concepts for solar-heated or	
AERODYHAMICS Security assessment of power system	s including	solar-driven absorption and compression c	ooling
energy storage and with the integ		machines for air conditioning and food preservation purposes, phase 1	
energy		[BMFT-PB-T-81-165] p0080	N82-15541
[DE81-030166]	p0140 N82-12590	AIR COHDUCTIVITY	
Soviet UCG experience specifically		Test results and analysis of a convective lessolar air collector	оор
field experiments in the United S [DE81-028642]	p0111 N82-13244		882-11599
ABROBLASTICITY	•	AIR PLON	
An aeroelastic analysis of the Darr		Optimization of flow passage geometry for	
[AIAA PAPER 81-2572] ARROHAUTICAL REGIMEERING	p0129 A82-14029	air-heating, plate-type solar collectors	A82-14846
Aeronautics and space report of the	Fresident.	Natural convection in air layers at various	
1980 activities	••••••	ratios and angles of inclination	
[NA SA-TM-84079]	p0035 H82-16022		182-16249
ARROSOLS Fingerprinting pollutant discharges	from cunfuele	Mathematical modelling of some chemical and	
plants	from syniders	physical processes in underground coal gasification	
£	p0001 A82-10697	f np81=0279411 p0116	N82-14613
Low-Btu-gasifier emissions toxicolo		Indoor air quality	
[DE81-031000]	p0014 N82-11651	[DE01-029837] P0033	N82-15611
Environmental effects of rellutants combustion. 2: The Colstrip, Mo.		AIR NAVIGATION Fuel efficient flight profiles in an ATC flo	o w
[PB81-234114]	p0026 N82-13573	management environment	-
Real time coarse particle mass meas			182-13078
high temperature and pressure coa	l gasifier	AIR POLLUTION	
process treatment [DE81-030036]	p0033 882-15609	Fingerprinting pollutant discharges from symplements	DIUELS
AEROSPACE ENGINEERING	P0000 202 15005		A82-10697
Nuclear electric power for space sy		Characteristics of combustion and pollutant	
Technology background and flight		formation in swirling flames	100 1007E
Macro-engineering: The rich potenti	p0123 A82-11756 al: Proceedings	Evaporative hydrocarbon emissions from a la	182-10875 rge
of the Third Symposium, San Franc		vehicle population	- 90
January 6, 1980			A82-14442
lemanautics and serves serves of the	p0006 A82-18643	Study of the formation of submicron particular	lates
Aeronautics and space report of the 1980 activities	trepreser,	generated by coal combustion [DE81-027447] p0008	N82-10586
	p0035 N82-16022	Studies of the regeneration of activated bar	
AGING (MATERIALS)		used as granular sorbent for the control (
Aging and corrosion problems with fi energy absorbers. Study based upo		alkalı vapors from hot flue gas of coal co [DB81-030192] p0008	ombustion
and experiment exchanges			N82-10590
and experiment exchanges [SP-RAPP-1979/4]	p0077 N82-13548	Coal gasifier parameters influencing environ pollutant production	N82-10590
[SP-RAPP-1979/4] AGRICULTURE	p0077 N82-13548	Coal gasifier parameters influencing environmental pollutant production [PB81-221301] p0011	N82-10590 nmental N82-11273
[SP-RAPP-1979/4]	. p0077 N82-13548	Coal gasifier parameters influencing environmental pollutant production [PB81-221301] p0011 An evaluation of three-way control single and	N82-10590 nmental N82-11273 nd_dual
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass f	p0077 N82-13548 uels p0001 A82-11542 beating	Coal gasifier parameters influencing environmental pollutant production [PB81-221301] In evaluation of three-way control single as bed catalysts as applied to heavy-duty gas	N82-10590 nmental N82-11273 nd_dual
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water	p0077 N82-13548 uels p0001 A82-11542 beating p0134 A82-17639	Coal gasifier parameters influencing environmental pollutant production [PB81-221301] p0011 An evaluation of three-way control single and bed catalysts as applied to heavy-duty gasengines	N82-10590 nmental N82-11273 nd_dual
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic po	p0077 N82-13548 uels p0001 A82-11542 beating p0134 A82-17639 ower systems	Coal gasifier parameters influencing environmental production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] PD012 is production of the Automotive Cylinder	N82-10590 nmental N82-11273 nd dual soline N82-11477
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic programming the programming of the programming applications in the programming of the	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico	Coal gasifier parameters influencing environmental pollutant production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5	N82-10590 nmental N82-11273 nd dual soline N82-11477
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic po	p0077 N82-13548 uels p0001 A82-11542 beating p0134 A82-17639 ower systems Hexico p0007 N82-10506	Coal gasifier parameters influencing environmental pollutant production [PB81-221301] In evaluation of three-way control single and bed catalysts as applied to heavy-duty gasengines [PB81-224982] BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Say	N82-10590 nmental N82-11273 nd dual soline N82-11477
[SP-RAPP-1979/4] AGRICULTURB Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic profor agricultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems	p0077 N82-13548 uels p0001 A82-11542 beating p0134 A82-17639 ower systems Mexico p0007 N82-10506 parabolic dish	Coal gasifier parameters influencing environmental production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] EPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Sat [PB81-228256] Control of utility boiler and gas turbine	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic performation of agricultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955]	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549	Coal gasifier parameters influencing environmobilitiant production [PB81-221301] In evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Sar [PB81-228256] Control of utility boiler and gas turbine pollutant emissions by combustion modifications.	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic performed agricultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocess	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden,	Coal gasifier parameters influencing environmental pollutant production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] EPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Samples [PB81-228256] Control of utility boiler and gas turbine pollutant emissions by combustion modifications 2	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation,
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic performation of agricultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955]	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden,	Coal gasifier parameters influencing environmental pollutant production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] EPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Samples [PB81-228256] Control of utility boiler and gas turbine pollutant emissions by combustion modifications 2	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic performation of agricultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocosicularituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642]	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 farabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524	Coal gasifier parameters influencing environmobilitant production [PB81-221301] In evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Sar [PB81-228256] Control of utility boiler and gas turbine pollutant emissions by combustion modification phase 2 [PB81-222267] Selected studies of four high-temperature air-pollution sources	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation,
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic performagnicultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocosicularituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 farabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524	Coal gasifier parameters influencing environmental production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Same [PB81-228256] Control of utility boiler and gas turbine pollutant emissions by combustion modificate phase 2 [PB81-222267] Selected studies of four high-temperature air-pollution sources	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic proform agricultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocost Currituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in sector	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 farabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524	Coal gasifier parameters influencing environmobilitant production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gas engines [PB81-224982] [PB81-224982] [PB81-224982] [PB81-224982] [PB81-224982] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-228257] [PB81-222267] [PB81-2	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic performagnicultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocosicularituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 over systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden, Ferguimans p0109 N82-12524 n the US farm p0018 N82-12580	Coal gasifier parameters influencing environmobilitant production [PB81-221301] In evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Sas [PB81-228256] Control of utility boiler and gas turbine pollutant emissions by combustion modification phase 2 [PB81-222267] Selected studies of four high-temperature air-pollution sources PO015 Preliminary study: Use of low-sulfur coal coal cleaning in control of acid rain [DE81-028930]	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic performagnicultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocost Currituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in sector [DE81-904220] Energy balance and utilization of agwaste on a farm	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524 h the US farm p0018 N82-12580 gricultural	Coal gasifier parameters influencing environ pollutant production [PB81-221301] p0011 An evaluation of three-way control single at bed catalysts as applied to heavy-duty gasengines [PB81-224982] p0012 BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Same [PB81-228256] p0013 Control of utility boiler and gas turbine pollutant emissions by combustion modificate phase 2 [PB81-222267] p0015 Selected studies of four high-temperature air-pollution sources p0015 Preliminary study: Use of low-sulfur coal accoal cleaning in control of acid rain [DB81-028930] p0021 Sulfur in the air in the capital (Belsinks)	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic proform agricultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocost Currituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in sector [DE81-904220] Energy balance and utilization of agwaste on a farm [PB81-229262]	p0077 N82-13548 uels p0001 A82-11542 beating p0134 A82-17639 ower systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524 n the US farm p0018 N82-12580 gricultural p0115 N82-14385	Coal gasifier parameters influencing environ pollutant production [PB81-221301] p0011 An evaluation of three-way control single as bed catalysts as applied to heavy-duty gas engines [PB81-224982] p0012 BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Say [PB81-228256] p0013 Control of utility boiler and gas turbine pollutant emissions by combustion modificate phase 2 [PB81-222267] p0015 Selected studies of four high-temperature air-pollution sources p0015 Preliminary study: Use of low-sulfur coal a coal cleaning in control of acid rain [DB81-028930] Sulfur in the air in the capital (Belsinki) metropolitan area: ITASAT-project	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic particultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocosicultures, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in sector [DE81-904220] Energy balance and utilization of advance on a farm [PB81-229262] Market assessment of photovoltaic positions.	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 over systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden, Ferguimans p0109 N82-12524 n the US farm p0018 N82-12580 gricultural p0115 N82-14385 over systems	Coal gasifier parameters influencing environ pollutant production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gas engines [PB81-224982] EPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Sar [PB81-228256] Control of utility boiler and gas turbine pollutant emissions by combustion modification phase 2 [PB81-222267] Selected studies of four high-temperature air-pollution sources P0015 Preliminary study: Use of low-sulfur coal a coal cleaning in control of acid rain [DE81-028930] Sulfur in the air in the capital (Eelsinki) metropolitan area: ITASAT-project [ER-614-71]	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic performagnicultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocost Currituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in sector [DE81-904220] Energy balance and utilization of agwaste on a farm [PB81-229262] Market assessment of photovoltaic performagnicultural applications in [NASA-CR-165477]	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 over systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden, Ferguimans p0109 N82-12524 n the US farm p0018 N82-12580 gricultural p0115 N82-14385 over systems	Coal gasifier parameters influencing environ pollutant production [PB81-221301] p0011 An evaluation of three-way control single at bed catalysts as applied to heavy-duty gasengines [PB81-224982] p0012 BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Say [PB81-228256] p0013 Control of utility boiler and gas turbine pollutant emissions by combustion modificated phase 2 [PB81-222267] p0015 Selected studies of four high-temperature air-pollution sources p0015 Preliminary study: Use of low-sulfur coal accoal cleaning in control of acid rain [DB81-028930] Sulfur in the air in the capital (Belsinki) metropolitan area: ITASAT-project [ER-614-71] Environmental effects of pollutants from coal combustion. 2: The Colstrip, Montana Pollogen (Belsinki) modification area (Bels	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675 N82-13553
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic proform agricultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocost Currituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in sector [DE81-904220] Energy balance and utilization of agree waste on a farm [PB81-229262] Market assessment of photovoltaic proform agricultural applications in [NASA-CR-165477] AIR COMDITIONING	p0077 N82-13548 uels p0001 A82-11542 beating p0134 A82-17639 ower systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524 n the US farm p0018 N82-12580 gricultural p0115 N82-14385 ower systems Merocco p0077 N82-14627	Coal gasifier parameters influencing environ pollutant production [PB81-221301] p0011 An evaluation of three-way control single as bed catalysts as applied to heavy-duty gas engines [PB81-224982] p0012 BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Say [PB81-228256] p0013 Control of utility boiler and gas turbine pollutant emissions by combustion modification phase 2 [PB81-222267] p0015 Selected studies of four high-temperature air-pollution sources p0015 Preliminary study: Use of low-sulfur coal coal cleaning in control of acid rain [DE81-028930] p0021 Sulfur in the air in the capital (Belsinki) metropolitan area: ITASAT-project [BR-614-71] p0025 Environmental effects of pollutants from coal combustion. 2: The Colstrip, Montana Poul [PB81-234114]	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675 N82-13553
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for the second process of the second process	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 over systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden, Ferguimans p0109 N82-12524 n the US farm p0018 N82-12580 gricultural p0115 N82-14385 over systems Mcrocco p0077 N82-14627 reasibility	Coal gasifier parameters influencing environ pollutant production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gas engines [PB81-224982] EPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Sam [PB81-228256] Control of utility boiler and gas turbine pollutant emissions by combustion modificate phase 2 [PB81-222267] Selected studies of four high-temperature air-pollution sources Preliminary study: Use of low-sulfur coal cleaning in control of acid rain [DE81-028930] Sulfur in the air in the capital (Eelsinki) metropolitan area: ITASAT-project [ER-614-71] Environmental effects of pollutants from coal combustion. 2: The Colstrip, Montana Poil (PB81-234114) Environmental hazard rankings of pollutants	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675 N82-13553 at
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for wind driven fluid devices for water Market assessment of photovoltaic proform agricultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocost Currituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in sector [DE81-904220] Energy balance and utilization of agree waste on a farm [PB81-229262] Market assessment of photovoltaic proform agricultural applications in [NASA-CR-165477] AIR COMDITIONING	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 over systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden, Ferguimans p0109 N82-12524 n the US farm p0018 N82-12580 gricultural p0115 N82-14385 over systems Mcrocco p0077 N82-14627 reasibility	Coal gasifier parameters influencing environ pollutant production [PB81-221301] p0011 An evaluation of three-way control single at bed catalysts as applied to heavy-duty gasengines [PB81-224982] p0012 BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Sam [PB81-228256] p0013 Control of utility boiler and gas turbine pollutant emissions by combustion modificate phase 2 [PB81-222267] p0015 Selected studies of four high-temperature air-pollution sources P0015 Preliminary study: Use of low-sulfur coal a coal cleaning in control of acid rain [DB81-028930] p0021 Sulfur in the air in the capital (Belsinki) metropolitan area: ITASAT-project [RR-614.71] Environmental effects of pollutants from coal combustion. 2: The Colstrip, Montana Poil (PB81-234114) p0026 Environmental hazard rankings of pollutants generated in coal gasification processes	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675 N82-13553 at ver Plant N82-13573
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for the second process of the second process	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 farabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524 n the US farm p0018 N82-12580 gricultural p0115 N82-14385 ower systems Mcrocco p0077 N82-14627 reasibility cn p0154 A82-11846 ng by the	Coal gasifier parameters influencing environ pollutant production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gas engines [PB81-224982] [PB81-224982] [PB81-224982] [PB81-224982] [PB81-224982] [PB81-22456] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-222267] [PB81-22267] [PB81-22267] [PB81-22267] [PB81-22267] [PB81-22267] [PB81-22267] [PB81-22267] [PB81-22367] [PB81-22367] [PB81-22367] [PB81-22367] [PB81-234114] [PB81-234114] [PB81-234114] [PB81-234114] [PB81-231698] [PB8	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675 N82-13573 N82-13573 N82-13573
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for the second process of the second process	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems dexico p0007 N82-10506 farabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524 the US farm p0018 N82-12580 gricultural p0115 N82-14385 ower systems derocco p0077 N82-14627 teasibility p0154 A82-11846 ag by the	Coal gasifier parameters influencing environ pollutant production [PB81-221301] p0011 An evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] p0012 BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Sas [PB81-228256] p0013 Control of utility boiler and gas turbine pollutant emissions by combustion modificated phase 2 [PB81-222267] p0015 Selected studies of four high-temperature air-pollution sources P0015 Preliminary study: Use of low-sulfur coal accoal cleaning in control of acid rain [DE81-028930] p0021 Sulfur in the air in the capital (Belsinki) metropolitan area: ITASAT-project [RR-614-71] Environmental effects of pollutants from coal combustion. 2: The Colstrip, Montana Poil (PB81-234114) Environmental hazard rankings of pollutants generated in coal gasification processes [PB81-231698] p0026 PCOal resources and sulphur emission regulating summary of 8 eastern and midwestern states.	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675 N82-13573 N82-13573 N82-13573
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for surviven fluid devices for water Market assessment of photovoltaic performagnicultural applications in [NASA-CR-165441] Irrigation market for sclar thermal systems [NASA-CR-164955] Peat deposits of Dismal Swamp pocosic Currituck, Gates, Pasquotank, and Counties, North Carolina [DE81-029642] Models for forecasting energy use in sector [DE81-904220] Energy balance and utilization of agrave on a farm [PB81-229262] Market assessment of photovoltaic performagnicultural applications in [NASA-CR-165477] AIR COMDITIONING Aquifer thermal energy storage - Asstudy for large scale demonstration of the study for large scale demonstration of the scale scale scale demonstration of the scale	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 prabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524 n the US farm p0018 N82-12580 gricultural p0115 N82-14385 ower systems Mercocco p0077 N82-14627 reasibility p0154 A82-11846 and by the p0012 N82-11323	Coal gasifier parameters influencing environmental pollutant production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gasengines [PB81-224982] BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 5 the Motor Vehicle Information and Cost Samp 1981-228256] [Control of utility boiler and gas turbine pollutant emissions by combustion modificated phase 2 [PB81-222267] Selected studies of four high-temperature air-pollution sources [PB81-222267] Selected studies of four high-temperature air-pollution sources [PB81-22930] Sulfur in the air in the capital (Belsinki) metropolitan area: ITASAT-project [BR-614-71] Environmental effects of pollutants from coacombustion. 2: The Colstrip, Montana Por [PB81-234114] Bruirconmental hazard rankings of pollutants generated in coal gasification processes [PB81-231698] Coal resources and sulphur emission regulating summary of 8 eastern and midwestern statal [PB81-240319]	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675 N82-13573 N82-13573 N82-13573
[SP-RAPP-1979/4] AGRICULTURE Agricultural policies and biomass for the second process of the second process	p0077 N82-13548 uels p0001 A82-11542 heating p0134 A82-17639 ower systems Mexico p0007 N82-10506 parabolic dish p0068 N82-11549 ins: Camden, Ferquimans p0109 N82-12524 n the US farm p0018 N82-12580 gricultural p0115 N82-14385 ower systems Merocco p0077 N82-14627 reasibility p0154 A82-11846 ag by the p0012 N82-11323 ps for	Coal gasifier parameters influencing environ pollutant production [PB81-221301] An evaluation of three-way control single as bed catalysts as applied to heavy-duty gas engines [PB81-224982] [PB81-224982] [PB81-224982] [PB81-224982] [PB81-224982] [PB81-224982] [PB81-22405] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-228256] [PB81-228257] [PB81-222267] [PB81-228256] [PB81-2367] [PB81-2367] [PB81-2367] [PB81-234114] [PB81-234114] [PB81-234114] [PB81-234114] [PB81-234114] [PB81-231698] [PB81-231698] [PB81-240319] [PB81-240319] [PB81-240319] [PB81-240319] [PB0015 PR015 PR0	N82-10590 nmental N82-11273 nd dual soline N82-11477 11 of ving Act N82-11480 ation, N82-11654 N82-11680 and N82-12675 N82-13573 N82-13573 N82-13573

SUBJECT INDEX

Demonstration of Wellman-Lord/Allied Chemical FGD technology: Demontration test second year results p0034 N82-15626	Fuel conservation measures in South African airways - A review of activity and a glimpse of future developments
Proceedings: Symposium on Plue Gas Desulfurization, volume 1	p0004 A82-15598 Liquid hydrogen - An outstanding alternate fuel
[PB81-243156] p0035 N82-15651 AIR QUALITY	for transport aircraft p0085 A82-17290
INEL goethermal environmental program [DE81-025671] p0008 M82-10591	Experimental study of fuel heating at low temperatures in a wing tank model, volume 1
. Relaxing environmental standards during oil-supply disruptions: Past, present and future	[NASA-CR-165391] p0100 N82-11224 External fuel vaporization study
[DE81-024250] p0009 N82-10601 Case studies in the arrlication of air quality modelling in environmental decision making:	[NASA-CR-165513] p0114 N82-14371 Pollution of the soil by aviation gasoline [PML-1979-41] p0032 N82-15596
Summary and recommendations [PB81-213233] p0009 M82-10605	AIRCRAFT GUIDANCE Fuel efficient flight profiles in an ATC flow
A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired	management environment p0002 A82-13078
power plant p0020 N82~12650	AIRCRAFT INDUSTRY Computer flight planning for fuel efficiency
Sulfur in the air in the capital (Belsinki)	p0006 A82-17289
metropolitan area: ITASAT-project [RR-614.71] p0025 N82-13553	AIRCRAFT PREFORMANCE Fuel conservation - DC-9 series 20/30/40
Indoor air quality [DE81-029857] p0033 N82-15611	p0002 A82-12563 Fuel conservation measures in South African
Assessment of the long-range transport of residential woodstove fine-particulate emissions	airways - A review of activity and a glimpse of future developments
for two future United States energy scenarios [DE81-030096] p0033 N82-15613 AIR TRAFFIC CONTROL	p0004 A82-15598 Rnergy savings with today's technology aircraft fuel management through in-flight
Fuel efficient flight profiles in an ATC flow	monitoring
management environment p0002 A82-13078 The use of flight management computers in air	p0005 A82-17282 Computer flight planning for fuel efficiency p0006 A82-17289
carrier operations in the 1980s [AD-A105621] p0027 M82-14071	<pre>liquid hydrogen - An outstanding alternate fuel for transport aircraft</pre>
AIRBORNE/SPACEBORNE COMPUTERS Fuel efficient flight profiles in an ATC flow	p0085 A82-17290 AIRFOIL PROFILES A first order mathematical model of the lift/drag
management environment p0002 A82-13078	characteristics of aerofoil sections
The role of avionics in the all electric airplane [AIAA 81-2219] The use of flight management computers in air carrier operations in the 1980s	p0130 A82-14357 An indoor blade test facility for determining the basic aerodynamic properties of Darrieus wind turbine airfoils with test results for an NACA
[AD-A105621] p0027 N82-14071 AIRCRAFT CONTROL	0015 and a modified section p0136 #82-10005 German-Argentine experiment: Vertical-rotor wind
The all electric airplane - Its development and logistic support p0004 A82-14709	engine p0141 N82-12648
AIRCRAFT DESIGN Wing design for light transport aircraft with improved fuel economy	The effect of rotor blade thickness and surface finish on the performance of a small axial flow turbine
p0004 A82-14416 Fuel conservation measures in South African airways - A review of activity and a glimpse of	[NASA-TH-82726] p0141 N82-13114 AIRLINE OPERATIONS Analysis of integrated fuel-efficient, low-noise
future developments p0004 A82-15598	procedures in terminal-area operations [DE81-029833] p0022 N82-13014
Puel conservation now improvements for existing production run transport aircraft	AIRPORT PLANNING Analysis of integrated fuel-efficient, low-noise
p0005 A82-17281 The all-electric airplane - A new trend p0006 A82-17420	procedures in terminal-area operations [DE81-029833] p0022 N82-13014 ALASKA
Highlights of 1981 activities [NASA-NEWS-RELEASE-81-199] p0161 N82-15008 AIRCRAFT REGIMES	Environmental assessment of the Alaskan Continental Shelf: Annual reports of principal investigators for the year ending March 1980.
Fuel conservation now improvements for existing production run transport aircraft	Vclume 5: Hazards [PB81-225732] p0026 N82-13607
p0005 A82-17281 AIRCRAPT EQUIPMENT	Potential supply of synthetic fuels from Alaskan hydroelectric power and coal
A hidden advantage of permanent magnet electrical generating systems	[DE81-025743] p0114 N82-14381
p0122 A82-11720 The all electric airplane - Its development and	Biomass resources for alcohol fuels p0090 A82-12533
logistic support p0004 A82-14709	Alcohol fuels bioliography, 1901 - March 1980 [DE81-025482] p0095 N82-10263
AIRCRAFT FUEL SYSTEMS	Development of a small-scale commercial alcohol
Experimental study of fuel heating at low temperatures in a wing tank model, volume 1	dehydration 190 to 200 proof [DE81-030158] p0100 N82-11235
[NASA-CR-165391] p0100 N82-11224 External fuel vaporization study	Alcohol fuels in the United States [DE81-026013] p0010 N82-11265
[NASA-CR-165513] p0114 N82-14371 AIRCRAFT FORLS	Synthesis gas conversion to liquid fuels using promoted fused iron catalysts
Puel for future transport aircraft	. [DE81-030857] p0108 N82-12259
[ASME PAPER 81-HT-80] p0089 A82-10965 Fuel conservation - DC-9 series 20/30/40	Studies on sugarcane as an energy crop for Punjab [PB81-232308] p0115 N82-14386
p0002 A82-12563	Progress report to the Department of Energy in
Aviation gasoline versus automotive gasoline [AIAA PAPER 81-1705] p0091 A82-14395	support of basic energy and policy research [DE81-025882] p0028 N82-14648

	urning alcohol in	Carrier-collection efficiencies in	amorphous
diesel engines [DB81-025834]	p0030 N82-15219	hydrogenated silicon Schottky-bar	rier solar cells p0042 182-11185
ALGORITHMS	P	Stability of n-1-p amorphous silico	n solar cells
Algorithm for computing in-situ	ccmbustion oil	11	p0043 A82-11343
recovery performance [DE81-030340]	p0098 882-11153	Advances in photovoltaics R&D - An	overview p0047 A82-11793
Methodology and basic algorithm		Progress in large area photovoltaic	
Economic Modeling Systems	p0J35 N82-15833	on amorphous silicon alloys	-00//0 193-11050
(DE81-029430) ALIGHMENT	p0035 M82-15833	Amorphous silicon bibliography - In	p0049 A82-11855
An active alignment scheme for	the MFIS array	and process of the second process of the sec	p0053 A82-13737
1	p0147 N82-12541	A comparison of p-i-n and Schottky	
An interferometer-based phase c	p0147 N82-12547	hydrogenated amorphous silicon, a cells	-51; n, solar
ALIPHATIC COMPOUNDS	po 202 .20		p0060 A82-17649
Design, construction, and cpera		Field nonuniformity due to photogen	erated carriers
scale experimental anaerobic : [DE81-029028]	p0110 N82-12605	in a p-i-n solar cell	p0060 A82-17650
Creating a safer environment in		Amplipiers	•
The Bureau of Mines Methane Co	ontrol Program,	Analytic investigation of efficienc	
[PB81-233918]	p0112 N82-13488	performance limits in klystron am multidimensional computer program:	
The utilisation of alcohol in 1		depressed collectors; and thermio	
engines	m0440 NO2-1505)	life studies	p0148 N82-12553
[PB81-244469] ALKALIBS	p0118 N82-15452	Session on solid state: Introduction	•
Alkaline solution water electro			p0149 N82-12565
ALKANES	p0083 A82-11786	Modified reference SPS with solid s	tate
Ion excharge characteristics of	enhanced oil	transmitting antenna	p0149 N82-12566
recovery systems (miscibility	studies)	SPS solid state antenna power combination	
[DE81-769734] ALKENES	p0096 N82-10478	AHAEROBES	p0149 N82-12567
Characterization of diesel emiss	sions as a function	Methane production from alkaline for	od waste
of fuel variables		•	p0092 N82-10115
[PB81-244048] ALKYL COMPOUNDS	p0118 N82-15233	Production and utilization of methat anaerobic sludge digestion in U.S	
Ion exchange characteristics of	enhanced oil	wastewater-treatment plants	•
recovery systems (miscibility		[DE81-029958]	p0101 N82-11246
[DE81-769734] ALPHA PARTICLES	pC096 N82-10478	Design, construction, and operation scale experimental anaerobic ferm	
Effects of coal fly-ash disposal	l on water quality	[DB81-029028]	p0110 N82-12605
in and around the Indiana Dun	es National	Waste-to-energy Systems Institution	al Barriers
Lakesnore, Indiana [PB81-238479]	p0034 N82-15624	Assessment Workshop [DE82-000098]	p0019 N82-12621
ALTERNATING CURRENT	P0034 NOL 13014	ANALOG TO DIGITAL CONVERTERS	p0015 B02 1202
Improved technique to measure e		REPEAT facility. Report for May, J	
losses in superconducting cabi	p0150 N82-15338	[DE81-028156] ANECHOIC CHAMBERS	p0079 N82-14665
ALUMINUM	-	Establishment of noise acceptance c	riterıa for
Hydrogen generation by means of	catalyzed Mg-Al	wind turbines	p0125 A82-11825
hydrolysis	p0083 A82-10398	ANISOTROPIC MEDIA	PO 125 MOZ-11025
Pulverized-coal firing of alumin		Bounds and exact theories for the t	
[DOE/CS-40037/T2] Aluminum recovery from fly ash a	p0095 N82-10262	properties of inhomogeneous media	p0056 A82-15607
wastes	and phase record	Annealing	P0030 mor .300.
#astes		refer of annuality car a sister	
[DE81-027675]	p0099 N82-11154	Effect of annealing CdS on a sinter	ed CdS/Cu2S
[DE81-027675] ALUMINUM ALLOYS	_	solar cell	•
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide lattery de [ANL-81-14]	_		p0051 A82-12820
[DE81-027675] ALUMINUM ALLOTS Calcium/metal sulfide battery de [ANL-81-14] ALUMINUM OXIDES	evelorment program p0158 N82-11578	solar cell Effects of low temperature periodic the deep-level defects in 200 keV	p0051 A82-12820 annealing on proton
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al203	evelorment program p0158 N82-11578	solar cell Effects of low temperature periodic	p0051 A82-12820 annealing on proton s
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Ho/Al203 absorber coatings	evelorment program p0158 N82-11578	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS	p0051 A82-12820 annealing on proton s p0061 A82-18287
[DE81-027675] ALUMINUM ALLOTS Calcium/metal sulfide battery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al203 absorber coatings ANIMES	evelorment program p0158 B82-11578 3 selective p0060 A82-17253	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell ANNUAL VARIATIONS The annual variation of atmospheric	p0051 A82-12820 annealing on proton s p0061 A82-18287
[DE81-027675] ALUMINUM ALLOTS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al203 absorber coatings AMIMES Carcinogenic effects of coal-com	evelorment program p0158 N82-11578 3 selective p0060 A82-17253 aversion materials	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS	p0051 A82-12820 annealing on proton s p0061 A82-18287 CO2 thern Hemisphere
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide fattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al20: absorber coatings AMINES Carcinogenic effects of coal-con [DE81-028108] AMMONIA	p0158 N82-11578 3 selective p0060 A82-17253 aversion materials p0029 N82-14803	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the North A seasonally adjusted concentrator.	p0051 A82-12820 annealing on proton s p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156
[DE81-027675] ALUMINUM ALLOTS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al203 absorber coatings AMINES Carcinogenic effects of coal-com [DE81-028108] AMMONIA Small-scale uses and costs of hy	p0158 N82-11578 3 selective p0060 A82-17253 aversion materials p0029 N82-14803	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated Algaks-Gaks solar cell. ANBUAL VARIATIONS The annual variation of atmospheric concentration observed in the North	p0051 A82-12820 annealing on proton S p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide fattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al20: absorber coatings AMINES Carcinogenic effects of coal-con [DE81-028108] AMMONIA	p0158 N82-11578 3 selective p0060 A82-17253 aversion materials p0029 N82-14803	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the Normal Seasonally adjusted concentrator modifications of absorber shape	p0051 A82-12820 annealing on proton s p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide fattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al20: absorber coatings AMINES Carcinogenic effects of coal-cor [DE81-028108] AMMONIA Small-scale uses and costs of hy from OTEC ammonia Fuel nitrogen conversion during	p0158 N82-11578 3 selective	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the North Mariations of absorber shape Annual cycle energy system [DE81-024911]	p0051 A82-12820 annealing on proton s p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al203 absorber coatings AMIMES Carcinogenic effects of coal-com [DE81-028108] AMMONIA Small-scale uses and costs of hy from OTEC ammonia	p0158 N82-11578 3 selective p0060 A82-17253 Aversion materials p0029 N82-14803 ydrogen derived p0084 A82-11792 fuel rich and char	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the Normal seasonally adjusted concentrator modifications of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their in	p0051 A82-12820 annealing on proton s p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide fattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al20: absorber coatings AMINES Carcinogenic effects of coal-cor [DE81-028108] AMMONIA Small-scale uses and costs of hy from OTEC ammonia Fuel nitrogen conversion during	p0158 N82-11578 3 selective	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the North Assassmally adjusted concentrator modifications of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their is climate [DE81-027263]	p0051 A82-12820 annealing on proton s p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598 p0007 M82-10552 nfluence on
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al200 absorber coatings AMINES Carcinogenic effects of coal-com [DE81-028108] AMMONIA Small-scale uses and costs of hy from OTEC ammonia Puel nitrogen conversion during combustion of pulverized coal AMMONIUM SULFATES Process for removing sulfur oxide	p0158 N82-11578 3 selective p0060 A82-17253 nversion materials p0029 N82-14803 ydrogen derived p0084 A82-11792 fuel rich and char p0105 N82-12156 des from gases with	solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the North Assessmally adjusted concentrator modifications of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their in climate [DB81-027263] Seasonal performance factors for activated the seasonal performance factors of the seasonal performance factors of the seasonal performance factors for activated the seasonal performance factors factors factors factors factors factors factors factors factors fa	p0051 A82-12820 annealing on proton s p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598 p0007 M82-10552 nfluence on
[DE81-027675] ALUMINUM ALLOTS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al20: absorber coatings AMINES Carcinogenic effects of coal-cor [DE81-028108] AMMOBIA Small-scale uses and costs of hy from OTEC ammonia Puel nitrogen conversion during combustion of pulverized coal AMMOBIUM SULFATES Process for removing sulfur oxic direct production of a usable	p0158 N82-11578 3 selective p0060 A82-17253 aversion materials p0029 N82-14803 ydrogen derived p0084 A82-11792 fuel rich and char p0105 N82-12156 des from gases with finished reaction	solar cell Bifects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the Normal seasonally adjusted concentrator modifications of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their in climate [DE81-027263] Seasonal performance factors for acceptable and heat-pump systems	p0051 A82-12820 annealing on proton S p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598 p0007 N82-10552 nfluence on p0016 N82-11731
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide fattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al203 absorber coatings AMIMES Carcinogenic effects of coal-com [DE81-028108] AMMOBIA Small-scale uses and costs of hy from OTEC ammonia Puel nitrogen conversion during combustion of pulverized coal AMMOBIUM SULFATES Process for removing sulfur oxid direct production of a usable product ammonium sulfate of [BMFT-PB-T-81-102]	p0158 N82-11578 3 selective p0060 A82-17253 aversion materials p0029 N82-14803 ydrogen derived p0084 A82-11792 fuel rich and char p0105 N82-12156 des from gases with finished reaction	Solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the North Modifications of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their is climate [DE81-027263] Seasonal performance factors for act systems and heat-pump systems [DE81-028569] Annual cycle energy system experiments.	p0051 A82-12820 annealing on proton s p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598 p0007 M82-10552 nfluence on p0016 M82-11731 tive solar p0074 M82-12625 ntal
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al20: absorber coatings AMINES Carcinogenic effects of coal-cor [DE81-028108] AMMONIA Small-scale uses and costs of hy from OTEC ammonia Puel nitrogen conversion during combustion of pulverized coal AMMONIUM SULFATES Process for removing sulfur oxid direct production of a usable product ammonium sulfate is [BMFT-F8-T-81-102] AMORPHOUS MATERIALS	p0158 N82-11578 3 selective p0060 A82-17253 nversion materials p0029 N82-14803 ydrogen derived p0084 A82-11792 fuel rich and char p0105 N82-12156 des from gases with finished reaction fertilizer p0029 N82-15142	Solar cell Bifects of low temperature periodic the deep-level defects in 200 keV irradiated Algahs-Gahs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the North Concentration of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their in climate [DE81-027263] Seasonal performance factors for active systems and heat-pump systems [DE81-028569] Annual cycle energy system experiments performance and national applicab.	p0051 A82-12820 annealing on proton p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598 p0007 M82-10552 nfluence on p0016 M82-11734 tive solar p0074 M82-12625 ntal ility
[DE81-027675] ALUMINUM ALLOTS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al20: absorber coatings AMINES Carcinogenic effects of coal-cor [DE81-028108] AMMOBIA Small-scale uses and costs of hy from OTEC ammonia Puel nitrogen conversion during combustion of pulverized coal AMMOBIUM SULFATES Process for removing sulfur oxic direct production of a usable product ammonium sulfate of [BMFT-PB-T-81-102] AMORPHOUS MATERIALS National photovoltaic program in	p0158 N82-11578 3 selective p0060 A82-17253 aversion materials p0029 N82-14803 ydrogen derived p0084 A82-11792 fuel rich and char p0105 N82-12156 des from gases with finished reaction fertilizer p0029 N82-15142	solar cell Bifects of low temperature periodic the deep-level defects in 200 keV irradiated AlgaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the Normal seasonally adjusted concentrator modifications of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their in climate [DE81-027263] Seasonal performance factors for act systems and heat-pump systems [DE81-028569] Annual cycle energy system experiment performance and national applicable [DE81-028570]	p0051 A82-12820 annealing on proton CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598 p0007 M82-10552 nfluence on p0016 M82-11731 tive solar p0074 M82-12625 ntal ility p0024 M82-13523
[DE81-027675] ALUMINUM ALLOTS Calcium/metal sulfide fattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al202 absorber coatings AMINES Carcinogenic effects of coal-composited [DE81-028108] AMMOBIA Small-scale uses and costs of hyperic from OTEC ammonia Puel nitrogen conversion during combustion of pulverized coal AMMOBIUM SULFATES Process for removing sulfur oxided in the product ammonium sulfate of [BHFT-FB-T-81-102] AMORPHOUS MATERIALS National photovoltaic program in [DE81-025906] AMORPHOUS SEMICONDUCTORS	p0158 N82-11578 3 selective p0060 A82-17253 nversion materials p0029 N82-14803 ydrogen derived p0084 A82-11792 fuel rich and char p0105 N82-12156 des from gases with finished reaction fertilizer p0029 N82-15142 a amorphous materials p0070 N82-11609	Solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the North Concentration of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their in climate [DE81-027263] Seasonal performance factors for acc systems and heat-pump systems [DE81-028569] Annual cycle energy system experiment performance and national applicable [DE81-028570] REPEAT facility. Report for May, June 1981-028156]	p0051 A82-12820 annealing on proton p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598 p0007 M82-10552 nfluence on p0016 M82-11731 tive solar p0074 M82-12625 ntal ility p0024 M82-13523 une, July p0079 M82-14665
[DE81-027675] ALUMINUM ALLOYS Calcium/metal sulfide lattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al20. absorber coatings AMINES Carcinogenic effects of coal-cor [DE81-028108] AMMONIA Small-scale uses and costs of hy from OTEC ammonia Fuel nitrogen conversion during combustion of pulverized coal AMMONIUM SULFATES Process for removing sulfur oxid direct production of a usable product ammonium sulfate is [BMFT-PS-T-81-102] AMORPHOUS MATERIALS National photovoltaic program in [DE81-025906] AMORPHOUS SEMICONDUCTORS Introduction to basic aspects of	p0158 N82-11578 3 selective p0060 A82-17253 Aversion materials p0029 N82-14803 ydrogen derived p0084 A82-11792 fuel rich and char p0105 N82-12156 des from gases with fibished reaction fertilizer p0029 N82-15142 a amorphous materials p0070 N82-11609 f plasma-deposited	Solar cell Bifects of low temperature periodic the deep-level defects in 200 keV irradiated AlgaAs-GaAs solar cell. ANNUAL VABIATIONS The annual variation of atmospheric concentration observed in the North Concentration of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their in climate [DE81-027263] Seasonal performance factors for act systems and heat-pump systems [DE81-028569] Annual cycle energy system experiment performance and national applicable [DE81-028570] REPEAT facility. Report for May, Juliand speed simulation for economic centers.	p0051 A82-12820 annealing on proton p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598 p0007 M82-10552 nfluence on p0016 M82-11731 tive solar p0074 M82-12625 ntal ility p0024 M82-13523 une, July p0079 M82-14665
[DE81-027675] ALUMINUM ALLOTS Calcium/metal sulfide fattery de [ANL-81-14] ALUMINUM OXIDES Sputter-deposited Al203/Mo/Al202 absorber coatings AMINES Carcinogenic effects of coal-composited [DE81-028108] AMMOBIA Small-scale uses and costs of hyperic from OTEC ammonia Puel nitrogen conversion during combustion of pulverized coal AMMOBIUM SULFATES Process for removing sulfur oxided in the product ammonium sulfate of [BHFT-FB-T-81-102] AMORPHOUS MATERIALS National photovoltaic program in [DE81-025906] AMORPHOUS SEMICONDUCTORS	p0158 N82-11578 3 selective p0060 A82-17253 Aversion materials p0029 N82-14803 ydrogen derived p0084 A82-11792 fuel rich and char p0105 N82-12156 des from gases with fibished reaction fertilizer p0029 N82-15142 a amorphous materials p0070 N82-11609 f plasma-deposited	Solar cell Effects of low temperature periodic the deep-level defects in 200 keV irradiated AlGaAs-GaAs solar cell. ANNUAL VARIATIONS The annual variation of atmospheric concentration observed in the North Concentration of absorber shape Annual cycle energy system [DE81-024911] Oceans and ocean currents: Their in climate [DE81-027263] Seasonal performance factors for acc systems and heat-pump systems [DE81-028569] Annual cycle energy system experiment performance and national applicable [DE81-028570] REPEAT facility. Report for May, June 1981-028156]	p0051 A82-12820 annealing on proton p0061 A82-18287 CO2 thern Hemisphere p0002 A82-12156 with p0059 A82-16598 p0007 M82-10552 nfluence on p0016 M82-11731 tive solar p0074 M82-12625 ntal ility p0024 M82-13523 une, July p0079 M82-14665

Amas ==	
ANODES	Review of simulation techniques for Aquifer
Baking of carbon anodes for the electrolysis of	Thermal Energy Storage (ATES) [DE81-029943] p0156 N82-10532
aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168	Study of ATES thermal behavior using a steady flow
ANODIZING	model
Investigation of the in-situ oxidation of methanol	[DE81-030883] p0159 N82-12396
in fuel cells	Bibliography of the seasonal thermal energy
[AD-A105947] p0143 N82-14642	storage library
ANTENNA ARRAIS	[DE81-030470] p0159 N82-12586
Workshop on Microwave Power Transmission and	Compressed air energy storage: Preliminary design
Reception. Workshop paper summaries [NASA-TH-84064] p0146 H82-12538	and site development program in an aquifer. Volume 2: Utility system planning
An active alignment scheme for the MFTS array	[DE82-000466] p0159 N82-13544
p0147 H82-12541	Waste heat and chill storage in aquifer systems
Design and breadboard evaluation of the SPS	[DR81-028016] p0159 N82-14652
reference phase control system concept	Structural evolution of three
p0072 N82-12545	geopressured-geothermal areas in the Texas Gulf
SPS antenna element evaluation	Coast [DB81-029799] p0118 N82-15505
p0148 N82-12555 The Resonant Cavity Radiator (RCE)	ARCHITECTOR B
p0148 N82-12556	Earth shelter 2. 1979-1980 USC series
Evaluation of thick wall wave guide element	[CONF-800438] p0006 N82-10277
p0148 N82-12557	MASEC SOLAR 80 home designs
Method for precision forming of low-cost,	[DE81-028344] p0067 N82-11316
thin-walled slotted waveguide arrays for the SPS	Site And Neighborhood Design (SAND): Development
p0148 N82-12558	of simplified automated building thermal load
Rectenna array measurement results p0149 N82-12564	procedures, phase 1 [DE81-027138] p0011 N82-11317
ANTENNA DESIGN	Sampling design for the 1980 commercial and
Antenna optimization and cost consideration for	multifamily residential building survey
the Solar Power Satellite microwave system	[DE81-028783] p0011 N82-11320
p0145 A82-11744	User needs for solar decision-making tools: The
SPS antenna element evaluation	homebuilding industry
p0148 N82-12555	[DE81-027293] p0067 N82-11325
The Resonant Cavity Radiator (RCR) p0148 N82-12556	Solar energy system performance evaluation: Forest City Dillon, Washington, D.C., January
Evaluation of thick wall wave guide element	1980 - December 1980
p0148 N82-12557	[DE81-028174] p0068 N82-11560
Rectenna system design	Solar energy system performance evaluation:
p0149 N82-12561	Montecito Pines, Santa Rosa, California,
Rectenna session: Micro aspects	November 1979 - April 1980
p0149 N82-12562	[DB81-028175] p0068 N82-11561
A theoretical study of microwave beam absorption	Solar explosion
by a rectenna p0149 N82-12563	[DE81-026086] p0074 N82-12628 Residential site design and energy conservation.
Modified reference SPS with solid state	Part 1: General report
transmitting antenna	[DB81-904010] p0027 N82-14398
p0149 N82-12566	Design of an energy conservation building
SPS solid state antenna rower combiner	[NASA-TM-83175] p0027 N82-14632
p0149 N82-12567	Performance predictions of passive solar
Solid-state retrodirective phased array concepts	commercial buildings
for microwave power transmission from Solar Power Satellite	[DE81-027979] p0079 N82-15247 Technology change and energy consumption: A
p0149 N82-12568	comparison of residential subdivisions
ANTENNA RADIATION PATTERNS	[DE81-030075] p0031 N82-15555
SPS large array simulation	Summary of passive solar multi-family design
p0071 N82-12540	workshops
Antinony	[DE81-030353] p0081 N82-15564
Gallium-arsenic-antimony heterojunction photocells	Indoor air quality
p0055 A82-14667 ANTIREPLECTION COATINGS	[DE81-029857] p0033 N82-15611
Present state of research on selective coatings	German-Argentine experiment: Vertical-rotor wind
for solar-energy converters	engine
p0039 A82-10387	p0141 N82-12648
Optical degradation of antireflective silica film	ARGON PLASMA
on solar collector windows	Ionization waves in an argon discharge in a
p0041 A82-10836	longitudinal gas flow
Combined solar-energy converters with selective	p0 127 A82-12666
coatings p0044 A82-11424	ARIZONA Guidebook for solar process-heat applications
Solar selective properties and high temperature	[DE81-027977] p0072 N82-12598
stability cf CVD ZrB2	Geologic applications of thermal-inertia mapping
p0057 A82-16055	from satellite Powder River, Wyoming; Cubeza
Metallurgical analysis and high temperature	Prieta, Arizona, and Yellowstone National Park
degradation of the black chrome solar selective	[E82-10011] p0118 N82-15489
absorber	ASHES
P0060 A82-17252 AQUEOUS SOLUTIONS	Crystallized fly-ash feasibility study [EPEI-EL-1836] p0009 N82-10599
Plutonium thermochemical solar cell	Coal fly ash: A review of the literature and
p0043 A82-11215	proposed classification system with emphasis on
Kinetics of wet oxidation of biological sludges	environmental impacts
from coal-conversion wastewater treatment	[PB81-215014] p0009 N82-10608
[DE82-000525] p0021 N82-12674	Aluminum recovery from fly ash and shale-retort
AQUIPERS	wastes [DE81-027675] p0099 N82-11154
Aquifer thermal energy storage - A feasibility study for large scale demonstration	[DE81-027675] p0099 N82-11154 Coal conversion solid waste disposal
p0154 A82-11846	[DE81-028567] p0116 N82-14680
F-10. 22 11010	£

Effects of coal fly-ash disposal on water quality	Jet impingement heat transfer enhancement for the
in and around the Indiana Dunes Bational Lakeshore, Indiana	GPU-3 Stirling engine [NASA-TM-82727] p0140 N82-11993
[PB81-238479] p0034 N82-15624	Assessment of flywheel system benefits in selected
ASPECT RATIO	vehicle applications . [DE81-025976] p0158 N82-11997
Natural convection in air layers at various aspect ratios and angles of inclination	[DE81-025976] p0158 N82-11997 AGT-102 automotive gas turbine
p0058 A82-16249	[NASA-CR-165353] p0140 N82-12444
ASPHALT	Test results and facility description for a
SOL-CYCLE: A solar-assisted solvent-recycling process for asphalt-impregnation of fiber board	40-kilowatt stirling engine [NASA-TM-82620] p0141 N82-13013
[DE81-903377] p0070 N82-11615	Augmentation of research and analysis capabilities
ASPHALTENES Charietan of lignite lignofaction	for timely support of automotive fuel economy
Chemistry of lignite liquefaction [DB81-030178] p0093 B82-10249	activities. Volume 1: Summary [PB81-219479] p0022 882-13018
ASSESSMENTS	Augmentation of research and analysis capabilities
<pre>Bcological effects assessment: Requirements vs state-of-the-art</pre>	for timely support of automotive fuel economy activities. Volume 2: Appendices A through C
[DE81-028092] p0032 N82-15598	[FB81-219487] p0022 882-13019
ATMOSPHERIC CHEMISTRY	Augmentation of research and analysis capabilities
Overview of the biomedical and environmental programs at the Oak Ridge National Laboratory	for timely support of automotive fuel economy activities. Volume 3: Appendix D
[DE81-027864] p0021 N82-12765	[FB81-219495] p0022 N82-13020
Response of the oceans to increasing atmospheric	Performance characteristics of automotive engines
carbon dioxide [DE81-028178] p0025 N82-13558	in the United States, third series: 1977 Chrysler 318 CID (5.21), 2V
ATMOSPHERIC CIRCULATION	[PB81-233025] p0023 N82-13435
Wind Power: Research on network wind power over	Controlled Speed Accessory Drive demonstration
the Pacific northwest. Executive summary	program [NASA-CR-165010] p0026 N82-13981
[DE81-029360] p0142 N82-13519 ATMOSPHERIC COMPOSITION	[NASA-CR-165010] p0026 N82-13981 Automotive fuel economy: Potential improvement
The annual variation of atmospheric CO2	through selected engine and differential gear
concentration observed in the Northern Hemisphere p0002 A82-12156	lubricants [PB81-240467] p0030 N82-15453
Selected studies of four high-temperature	AUTOMOBILE PUELS
air-pollution sources	Aviation gascline versus automotive gasoline
ATHOSPHERIC RPPECTS p0015 N82-11680	[AIAA PAPER 81-1705] p0091 A82-14395 Optimization of the composition and antidetonation
Investigation of abrasive action of atmospheric	properties of AI-93 gasoline
particles on the reflectance of mirrors	p0091 A82-15722
P0040 A82-10388 ATMOSPHERIC TURBULENCE	Technological innovation for success - Liquid hydrogen propulsion
Wind ripple analysis	p0084 A82-16734
[DE81-030129] p0138 N82-11044	Alcohol fuels in the United States
AUGHERTATION Potential environmental problems of enhanced oil	[DE81-026013] p0010 M82-11265 Third automotive fuel economy research contractors
and gas recovery techniques	coordination meeting
[PB81-240186] p0034 N82-15637	[PB81-222754] p0014 N82-11627
AUSTRALIA Status of solar energy research and development in	<pre>Project for reliability fleet testing of alcohol/gasoline blends</pre>
Australia	[DE82-000004] p0107 H82-12250
[NP-1903916] p0073 N82-12611 AUTOMATIC CONTROL	Performance characteristics of automotive engines in the United States, third series: 1977
Control of new energy sources in an electric	Chrysler 318 CID (5.2L), 2V
utility system	[FB81-233025] p0023 N82-13435
p0154 A82-13082 Vertical-axis wind-turbine control strategy	Evaluation of techniques for reducing in-use automotive fuel consumption
[DE81-031932] p0141 N82-12591	[PB81-233298] p0026 N82-13985
AUTOHOBILE ENGINES	Highway fuel economy study
A LH2 engine fuel system on board - Cold GH2 injection into two-stroke engine with LH2 pump	[PB81-233850] p0026 N82-13986 Alcohol fuels grant program at Lincoln Land
[ASME PAPER 81-HT-81] P0083 A82-10966	Community College, Springfield, Illinois
Liquid hydrogen for automotive vehicles -	[DE82-000744] p0114 H82-14375
Experimental results [ASME PAPEE 81-HT-83] p0083 A82-10968	Hotor gasolines, winter 1980-81 [DE81-030845] p0117 M82-15224
The AGT101 technology - An automotive alternative	Heavy-duty engine baseline program and NO sub x
p0123 A82-11783	emission standard development (1972-73) [PB81-244030] p0034 N82-15621
Lightweight hydrides for automotive storage of hydrogen	[PB81-244030] . p0034 N82-15621
p0084 A82-11790	Evaporative hydrocarbon emissions from a large
Energy conservation through utilization of mechanical energy storage	vehicle population
p0002 A82-11845	Alternative transportation vehicles for
Ceramics for the AGT101 automotive gas turbine	military-base operations
p0132 A82-16827 An evaluation of three-way control single and dual	p0005 A82-16348
	Impact of fuel-economy shortfall. Trends in
bed catalysts as applied to heavy-duty gasoline	Impact of fuel-economy shortfall: Trends in technology-weighted EPA versus on-road MPG.
engines	technology-weighted EPA versus on-road MPG. Periodic analysis memorandum no. 1
engines [PB81-224982] p0012 B82-11477	technology-weighted EPA versus on-road MPG. Periodic analysis memorandum no. 1 [DE81-030841] p0020 N82-12667
engines	technology-weighted EPA versus on-road MPG. Periodic analysis memorandum no. 1 [DE81-030841] p0020 N82-12667 Measures of effectiveness of transportation systems management
engines [PB81-224982] EPA evaluation of the FUEL-MAX device under Section 511 of the Motor Vehicle Information and Cost Savings Act	technology-weighted EPA versus on-road MPG. Periodic analysis memorandum no. 1 [DE81-030841] p0020 M82-12667 Measures of effectiveness of transportation systems management [PB81-233884] p0026 M82-13984
engines [PB81-224982] p0012 N82-11477 EPA evaluation of the FUEL-MAX device under Section 511 of the Motor Vehicle Information and Cost Savings Act [PB81-229866] p0012 N82-11479	technology-weighted EPA versus on-road MPG. Periodic analysis memorandum no. 1 [DE81-030841] p0020 N82-12667 Measures of effectiveness of transportation systems management [PB81-233884] p0026 N82-13984 AUXILIARY POWER SOURCES
engines [PB81-224982] p0012 N82-11477 EPA evaluation of the FUEL-MAX device under Section 511 of the Motor Vehicle Information and Cost Savings Act [PB81-229866] EPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 511 of	technology-weighted EPA versus on-road MPG. Periodic analysis memorandum no. 1 [DE81-030841] p0020 N82-12667 Measures of effectiveness of transportation systems management [PB81-233884] p0026 N82-13984 AUXILIARY POWER SOURCES Energy transfer in wind-assist electric power systems
engines [PB81-224982] P0012 N82-11477 EPA evaluation of the FUEL-MAX device under Section 511 of the Motor Vehicle Information and Cost Savings Act [PB81-229866] EPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 511 of the Motor Vehicle Information and Cost Saving Act	technology-weighted EPA versus on-road MPG. Periodic analysis memorandum no. 1 [DE81-030841] p0020 M82-12667 Measures of effectiveness of transportation systems management [PB81-233884] p0026 M82-13984 AUXILIARY POWER SOURCES Energy transfer in wind-assist electric power systems p0130 A82-14359
engines [PB81-224982] p0012 N82-11477 EPA evaluation of the FUEL-MAX device under Section 511 of the Motor Vehicle Information and Cost Savings Act [PB81-229866] EPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section 511 of	technology-weighted EPA versus on-road MPG. Periodic analysis memorandum no. 1 [DE81-030841] p0020 N82-12667 Measures of effectiveness of transportation systems management [PB81-233884] p0026 N82-13984 AUXILIARY POWER SOURCES Energy transfer in wind-assist electric power systems

SUBJECT INDEX BIOLOGICAL EPPECTS

A preliminary estimate of future communications traffic for the electric power system BENDING THEORY Application of orthotropic plate theory to [NASA-CR-165015] p0024 N82-13493 windmill blade design AVALANCHE DIODES p0121 A82-10978 K/u/-band flat-profile Si-IMPATT diodes with BRNRPICIATION Water and energy usage in coal preparation 10-percent efficiency [PB81-2382481 p0058 A82-16132 p0112 N82-13486 BETA PARTICLES The role of avionics in the all electric airplane
[AIAA 81-2219] p0002 A82-13
The use of flight management computers in air Effects of coal fly-ash disposal on water quality in and around the Indiana Dunes National P0002 A82-13457 Lakeshore, Indiana [PB81-238479] carrier operations in the 1980s p0034 N82-15624 [AD-A105621] BIBLIOGRAPHIES Amorphous silicon bibliography - Introduction AXES OF BOTATION German-Argentine experiment: Vertical-rotor wind p0053 A82-13737 Alcohol fuels bibliography, 1901 - March 1980 [DE81-025482] p0095 N82-10263 engine [DE81-025482] p0095 N8: Coal fly ash: A review of the literature and p0141 N82-12648 proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 Bibliography of the seasonal thermal energy p0009 N82-10608 BACKFIRE A study of factors influencing thermally induced backfiring in hydrogen fueled engines, and methods for backfire control storage library
[DE81-030470] p0159
Development of testing procedures and
bibliographic information relevant to the p0159 N82-12586 p0084 A82-11791 Baking of carbon anodes for the electrolysis of testing of solld wastes resulting from aluminum by electric resistance heating [BMFT-FB-T-81-168] p003 synthetic-fuels production [DE81-030671] p0021 N82-12673 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 p0030 N82-15168 BALANCING Composite flywheel balance experience [DE81-769341] p0157 N82-10549 BIOASSAY Development of newer methods for the isolation and BARRIER LAYERS identification of certain components found in complex mixtures derived from energy sources and the determination of their biological activity Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] p0024 N82-13489 BATTERY CHARGERS via bloassay systems Ampere-hour integrator battery charge controller [DE81-028311] Development of testing procedures and bibliographic information relevant to the p0153 A82-11737 Bffect of positive pulse charge waveforms on the energy efficiency of lead-acid traction cells testing of solid wastes resulting from synthetic fuels production [DE81-030822] p0020 M82-126 [NASA-TM-82709] p0155 N82-10503 Rapid charging of lead-acid batteries for electric-vehicle propulsion and solar-electric p0020 N82-12661 Development of testing procedures and bibliographic information relevant to the storage [DE81-028084] [DE81-028084] p0157 N82-10548 Recent progress in lithium/iron sulfide battery testing of solid wastes resulting from synthetic-fuels production development [DE81-023127] [DE81-030671] p0021 N82-12673 p0157 N82-10557 BIOCONVERSION BAYES THEOREM Energy from biomass and wastes V: Proceedings of Application of Bayesian analysis for wind energy the Fifth Symposium, Lake Buena Vista, PL, site evaluation January 26-30, 1981 p0090 A82-12400 p0113 N82-13619 BRAN PLASMA AMPLIPTERS Peat blogasification development program Advanced solar energy conversion --- solar pumped [DE81-028299] p0101 N82-11243 Production and utilization of methane from gas lasers [NASA-CR-165060] p0079 N82-15526 anaerobic sludge digestion in U.S. BEAMS (RADIATION)
Applications of power beaming from space-based wastewater-treatment plants [DE81-029958] p0101 N82-11246 nuclear power stations Interactive model to assess economics of anaerobic digestion of the farm D0145 A82-11746 [DE82-000452] p0110 N82-12620 Underground gasification of steeply dipping beds. Basis for research proposals concerning Phase 2 refort: Results of Rawlins test No. 1 [DE81-028581] p0094 N82-1 (industrial) solar energy production processes derived from biological principles p0094 N82-10255 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard p0075 N82-12640 Environmental and economic comparison of advanced rock. Volume 1: Executive summary processes for conversion of coal and biomass [DE81-029440] p0155 N82-10527 into clean energy Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 2: Project design criteria: UPH p0023 N82-13256 [PB81-234239] Biomethanation of biomass pyrolysis gases p0113 N82-13541 [DE82-000238] [DE81-028107] p0156 N82-10528 Feasibility study for an alcohol-fuels plant for Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES Buffalo, New York [DE82-000032] D0114 N82-14377 rock. Volume [DE81-028110] BIODEGRADATION p0157 N82-10574 Enhancement of methane gas production using an BEDS (PROCESS ENGINEERING)
Fixed-bed gasification
[DE82-000432] industrial waste in anaerobic digestion --effects of chrome shavings from leather tanning p0095 N82-10267 [DE81-023819] p0108 N82-12261 H-Coal product physical properties measurement [DE81-029095] p0111 N82 BIOGROCHEMISTRY p0111 N82-13245 Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming:
Preliminary results
[USGS-CIRC-837] p011 BRES Chronic exposure of a honey bee colony to 2.45 GHz continuous wave microwaves p0110 N82-12693 BIOLOGICAL EFFECTS p0003 A82-14347 Chronic exposure of a honey bee colony to 2.45 GHz continuous wave microwaves

p0003 A82-14347

BIOMASS	Energy Dalance and utilization of agricultural
The annual variation of atmospheric CO2	waste on a farm
concentration observed in the Northern Hemisphere	[PB81-229262] p0115 N82-14385
p0002 A82-12156	Studies on sugarcane as an energy crop for Punjab
Costs for alternative grain-residue-collection	[PB81-232308] p0115 N82-14386
systems	Education and training implications of biomass
[DE81-029072] p0110 N82-12633	energy system use
BIOMASS EMERGY FRODUCTION	[DE81-029956] p0028 M82-14664
Agricultural policies and biomass fuels	Thermochemical production of liquids from biomass
p0001 A82-11542	[DE81-030085] p0117 N82-15220
Enthanol fuels from Dicmass projects	BIOSYNTHESIS
p0089 A82-11837	Peat biogasification development program
Energy from biomass and wastes V: Proceedings of	[DE81-028299] p0101 N82-1124
the Fifth Symposium, Lake Buena Vista, FL,	Design, construction, and operation of a full
January 26-30, 1981	scale experimental anaerobic fermentation facility
p0090 A82-12400	[DE81-029028] p0110 N82-12605
Biomass resources for alcohol fuels	Blomethanation of biomass pyrolysis gases
p0090 A82-12533	[DE82-000238] p0113 N82-1354
Puels from bicmass and wastes Book	Improved polymers for enhanced oil recovery
p0091 A82-14986	synthesis and rheology
Biomass conversion processes for energy and fuels	[DE81-030194] p0118 N82-15509
Book	BISMOTH TELLURIDES
p0092 A82-18114	Production of alloys of bismuth telluride for
Methane production from alkaline food waste	solar thermoelectric generators
р0092 N82-10115	p0041 A82-1047
Kinetics and catalysis of producing synthetic	BITUEENS
gases from biomass	Liquefaction of bituminous coals using disposal
[PB81-217614] p0095 N82-10272	ore catalysts and hydrogen
Development of a small-scale commercial alcohol	[DE81-029134] p0093 N82-10154
dehydration 190 to 200 proof	BLANKETS (PUSION REACTORS)
[DE81-030158] p0100 N82-11235	Technology of controlled nuclear fusion
Near-term goals for alcohol fuels from biomass:	[DE81-027361] p0144 N82-15893
An overview of resource requirements, land use,	BOEING 727 AIRCRAFT
environmental, and socioeconomic impacts	Fuel conservation now improvements for
ethyl alcohol production	existing production run transport aircraft
[DE81-029987] p0010 N82-11245	p0005 A82-1728
Transportation fuels from synthetic gas	BORING 737 AIRCRAFT
[DE81-029614] p0102 N82-11258	Puel conservation now improvements for
Environmental research plan for gas supply	existing production run transport aircraft
technologies. Volume 2: Environmental research	p0005 A82-1728
plan	BOILERS
[PB81-222317] p0011 N82-11274	Present status of Florida Power Corporation's
Environmental research plan for gas supply	D.O.E. funded feasibility study of the Higgins
technologies. Vclume 1: Executive summary	plant repowering/coal gasification project
[PB81-222309] p0015 N82-11657	p0089 A82-11834
Partial acid hydrolysis pretreatment for enzymatic	An overview of fluidized-bed combustion /FBC/
hydrolysis of cellulose: A process development	design practice
study of ethanol production	p0090 A82-11850
p0107 N82-12236	The effect of non-Markovian cloud patterns on the
Development of hydroconversion of biomass to	design of a regulator for a solar-powered boiler
synthetic fuels	p0052 A82-13083
[DE81-030954] p0108 N82-12260	Technological activities for high performance
Design, construction, and operation of a full	receivers for solar thermal power plants
scale experimental anaerobic fermentation facility	[BMFT-PB-T-80-133] p0066 N82-10571
[DE81-029028] p0110 N82-12605	The Rogers focusing heliostat experimental program
Status of solar energy research and development in	at Rensselaer Polytechnic Institute
Australia	[PB81-226813] p0071 N82-11625
[NP-1903916] p0073 N82-12611	Control of utility boiler and gas turbine
Environmental and economic comparison of advanced	pollutant emissions by combustion modification,
processes for conversion of coal and biomass	phase 2
into clean energy	[PB81-222267] p0015 N82-11654
[PB81-234239] p0023 N82-13256	Magnetohydrodynamic research program of the MHD
Solar-central-receiver fuels and chemicals	Energy center at Mississippi State University
[DE82-000941] p0077 N82-13530	and structural features of MHD radiant boulers
Technology assessment of sclar energy systems:	[DE81-029901] p0139 N82-11934
Availability and impacts of woody blomass	Industrial application of fluidized-bed combustion
utilization in the Pacific Northwest	[DE81-030272] p0105 N82-12183
[DE82-000705] p0024 N82-13535	Workshop proceedings: U-bend tube cracking in
Biomass energy systems: Descriptions and	steam generators
employment requirements for typical operations	[DE81-903765] p0142 N82-13515
[DE82-000236] p0113 N82-13538	Evaluation of coal gasification/combined cycle
Blomethanation of biomass pyrolysis gases	power plant feasibility at the Sewells Point
[DE82-000238] p0113 N82-13541	Naval Complex, Norfolk, Virginia
Treatment of biomass gasification wastewaters	[AD-A103674] p0116 N82-14639
using reverse osmosis	Moorhead district heating, phase 2
[DE82-000698] p0025 N82-13566	[DE81-029689] p0031 N82-15556
Treatment of biomass-gasification wastewaters by	Evaluating R and D options under uncertainty.
wet-air oxidation	Volume 2: Atmospheric fluidized-bed combustion
[DE82-000935] p0025 N82-13567	commercialization strategies
Peasibility study for an alcohol-fuels plant for	[DE81-904246] p0035 N82-1601:
Buffalo, New York	BOILING
[DB82-000032] p0114 N82-14377	Boiling flow instability of a fixed mirror
Biomass energy utilization in the Facific	distributed focus solar receiver
Northwest: Impacts associated with residential	p0041 A82-1081
use of solid fuels	Characterization of diesel emissions as a function
[DE81-029137] p0115 N82-14383	of fuel variables
Fuels and chemicals made from solar energy	[PB81-244048] p0118 N82-1523
[DE81-025018] P0077 N82-14384	• • • • • • • • • • • • • • • • • • • •

SUBJECT INDEX CARBURETORS

BORRHOLES	Effect of annealing CdS on a sintered CdS/Cu2S
Sandia program in geothermal technology development	solar cell
[DB81-025394] p0119 N82-15546	p0051 A82-12820
BORIDES	Photoelectrochemical behaviour of CdS/NaI.3.3NH3
Solar selective properties and high temperature	/liguid sodium lodide ammoniate/ junctions -
stability of CVD ZIB2	Utilization in solar energy conversion
p0057 A82-16055	p0051 A82-12822
BORON ALLOYS	Nickel sulphide-lead sulphide and nickel
Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells	sulphide-cadmium sulphide selective coatings for solar thermal conversion
[DE81-027234] p0068 N82-11557	p0059 A82-16745
BRAYTON CYCLE	CADMIUM TELLURIDES
Nuclear reactor closed Brayton cycle space power	A numerical model of a graded band gap
conversion systems	CdS/x/Te/1-x/ solar cell
p0126 A82-11840	p0050 A82-12817
Brayton cycle using dissociating nitrosyl chloride	Preparation and properties of graded band gap
p0126 A82-11852	CdS/x/Te/1-x/ thin film solar cells
Buffer thermal energy storage for a solar Brayton	p0051 A82-12818
engine	Thin-film polycrystalline cadmium telluride solar
[AIAA PAPER 81-2531] p0053 A82-14002 Satellite power system: Concept development and	cells and large-area polycrystalline silicon solar cells
evaluation program. Volume 4: Energy	p0062 N82-10490
conversion and power management	Controlled cadmium telluride thin films for
[NASA-TH-58237-VOL-4] p0078 N82-14634	solar-cell applications
BRAZIL	[DE81-023275] p0066 N82-10569
Assessment of oil-shale technology in Brazil	CALCIUM FLUORIDES
[DE81-027574] p0010 N82-11249	Calcium/metal sulfide battery development program
BRINES	[ANL-81-14] p0158 N82-11578
Corrosion testing of carbon steel in aereated	CALIFORBIA
geothermal brine	Geophysical survey, Paso Robles geothermal area,
[DE81-028653] p0093 N82-10201	California, part of the resource assessment of
Geothermal environmental assessment: Benavior of selected geothermal brine contaminants in plants	low- and moderate-temperature geothermal resource areas in California
and soils	[DE81-026038] p0109 N82-12517
[PB81-222333] p0015 N82-11671	Resource assessment of Low and
Pormation evaluation in liquid-dominated	Moderate-temperature geothermal waters in
geothermal reservoirs	Calistoga, Napa County, California
[DOE/ET-28384/T1] p0109 N82-12514	[DE81-025559] p0109 N82-12518
Sampling and analysis of potential geothermal sites	CALORIC REQUIREMENTS
[PB81-240061] p0119 N82-15593	Energy expenditure and dietary change
BUFFER STORAGE	[PB81-218471] p0009 N82-10717
Buffer thermal energy storage for a solar Brayton engine	CAPACITANCE Low frequency capacitance characterizations on
[AIAA PAPER 81-2531] p0053 A82-14002	indium/x-phase of metal free phthalocyanine
BUILDINGS	solar cells
BUILDINGS Theoretical basis of the DOR-2 building energy use	solar cells p0053 A82-13806
BUILDINGS Theoretical basis of the DOE-2 building energy use analysis program	
Theoretical basis of the DOE-2 building energy use	p0053 A82-13806
Theoretical basis of the DOR-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS)	p0053 A82-13806 CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURRAUS (ORGANIZATIONS) Department of Energy projects	p0053 A82-13806 CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGAMIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579	p0053 A82-13806 CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS	p0053 A82-13806 CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNBES Flame-retention head burner efficiency test	p0053 A82-13806 CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide
Theoretical basis of the DOE-2 building energy use analysis program [DE81-02896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment	p0053 A82-13806 CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558
Theoretical basis of the DOB-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program	p0053 A82-13806 CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION
Theoretical basis of the DOB-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program	p0053 A82-13806 CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGABIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURBERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURBING RATE Fundamentals of nitric oxide formation in	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608	p0053 A82-13806 CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction:
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MOMOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction:
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquefaction: Catalytic and thermal upgrading of coal liquefaction:
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11259 Control of hydrocarbons and carbon monoxide via
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration
Theoretical basis of the DOE-2 building energy use analysis program [DE81-02896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FE-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STEELS
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 C CADMIUM COMPOUNDS Parametric study of the cadmium	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STERLS Corrosion testing of carbon steel in aereated
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 CC CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STBELS Corrosion testing of carbon steel in aereated geothermal brine
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BUREES Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 C CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STEELS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 C CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle P0083 A82-11785 Investigations on a Se-Cd0 photovoltaic cell	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STEELS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 CARBONHACBOUS MATERIALS
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BUREES Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 C CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STEELS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BUREBES Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 C CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle P0083 A82-11785 Investigations on a Se-CdO photovoltaic cell	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] CARBON STBELS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 CARBONACEOUS MATERIALS Transport Characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthracitic carbonaceous
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 CC CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle Investigations on a Se-CdO photovoltaic cell p0083 A82-11785 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 CADMIUM SULPIDES Solution grown PbS/CdS multilayer stacks as selective absorbers	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STEBLS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 CARBONACBOUS MATERIALS Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthractic carbonaceous shale resources, Narragansett Basin,
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 CC CADMIUM COMPOUNDS Farametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 CADMIUM SULFIDES Solution grown PbS/CdS multilayer stacks as selective absorbers	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STEELS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 CARBONACEOUS MATERIALS Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-00038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING BATE Fundamentals of nitric oxide formation in fossii-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 C CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 CADMIUM SULFIDES Solution grown PbS/CdS multilayer stacks as selective absorbers p0041 A82-10472 Infrared quenching of photocapacitance in	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STEELS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 CARBONACEOUS MATERIALS Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BUREERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING BATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Fower-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 C CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle P0083 A82-11785 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 CADMIUM SULPIDES Solution grown PbS/CdS multilayer stacks as selective absorbers p0041 A82-10472 Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] CARBON STEELS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-13560 CARBONACBOUS MATERIALS Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895]
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURENUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING BATR Fundamentals of nitric oxide formation in fossii-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 CC CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle [DE81-025452] p0083 A82-11785 Investigations on a Se-CdO photovoltaic cell [D0132 A82-16052] CADMIUM SULPIDES Solution grown PbS/CdS multilayer stacks as selective absorbers [D0042 A82-11187]	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11259 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CABBON STEBLS COITOSION testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 CARBONACEOUS MATERIALS Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthractic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] CARBONATES Carbonate fuel cell power plant systems
Theoretical basis of the DOE-2 building energy use analysis program [DE81-02896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 CC CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 CADMIUM SULPIDES Solution grown PDS/CdS multilayer stacks as selective absorbers p0041 A82-10472 Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells p0042 A82-11187 A numerical model of a graded band gap	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STERLS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 CARBONACBOUS MATERIALS Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthractic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523 CARBONATES Carbonate fuel cell power plant systems
Theoretical basis of the DOE-2 building energy use analysis program [DE81-02896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Pundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 CC CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 CADMIUM SULPIDES Solution grown PbS/CdS multilayer stacks as selective absorbers p0041 A82-10472 Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells p0042 A82-11187 A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BHTT-FB-T-81-168] p0030 N82-15168 CARBON DIONIDB Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STRELS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 CARBONACEOUS NATERIALS Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523 CARBONATES Carbonate fuel cell power plant systems p0131 A82-15069 Solid-solid reactions in coal conversion processes
Theoretical basis of the DOE-2 building energy use analysis program [DE81-02896] p0030 N82-15242 BUREAUS (ORGABIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Fundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0093 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 CC CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 CADMIUM SULPIDES Solution grown PbS/CdS multilayer stacks as selective absorbers p0041 A82-10472 Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells p0042 A82-11187 A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE COMCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STERLS Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 CARBONACBOUS MATERIALS Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthractic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523 CARBONATES Carbonate fuel cell power plant systems
Theoretical basis of the DOE-2 building energy use analysis program [DE81-02896] p0030 N82-15242 BUREAUS (ORGANIZATIONS) Department of Energy projects [DE82-000038] p0018 N82-12579 BURNERS Flame-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-030219] p0093 N82-10153 BURNING RATE Pundamentals of nitric oxide formation in fossil-fuel combustion [DE81-030329] p0033 N82-15608 BY-PRODUCTS Oxydesulfurization of coal by acidic iron sulfate solutions [DE82-000464] p0106 N82-12199 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-13191 CC CADMIUM COMPOUNDS Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 CADMIUM SULPIDES Solution grown PbS/CdS multilayer stacks as selective absorbers p0041 A82-10472 Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells p0042 A82-11187 A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell	CARBON Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BHTT-FB-T-81-168] p0030 N82-15168 CARBON DIOXIDE Response of the oceans to increasing atmospheric carbon dioxide [DE81-028178] p0025 N82-13558 CARBON DIOXIDE CONCENTRATION The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156 CARBON MONOXIDE Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/1] p0102 N82-11259 Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260 Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] p0025 N82-13560 CARBON STEELS Corrosion testing of carbon steel in aereated geothermal brine [DE81-02853] p0093 N82-10201 CABBONACEGOUS NATERIALS Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523 CARBONATES Carbonate fuel cell power plant systems p0107 N82-12238

CARCINOGENS SUBJECT INDEX

CIRCINGGER	Development of commiss desits
CARCINOGRES	Development of superior denitrogenation and
Carcinogenic effects of coal-conversion materials	isomerization catalysts for processing crude oil
[DE81-028108] , p0029 N82-14803	derived from shale, part 1
CARRIER DENSITY (SOLID STATE)	[AD-A105667] p0113 N82-14317
Theory of back surface field silicon solar cells	Catalytic effect of iron in hydrogasification of
p0056 A82-15447	coal
CARRIER HOBILITY	[DB81-023928] p0113 N82-14323
Carrier-collection efficiencies in amorphous	Exploratory study of coal-conversion chemistry
hydrogenated silicon Schottky-barrier solar cells	[DE81-016136] p0119 #82-15552
p0042 A82-11185	Kinetics of reactions in a wet flue gas
CARRIER TRANSPORT (SOLID STATE)	simultaneous desulfurization and denitrification
Vertical solar cell and internal electric field	System
p0042 A82-11189	[DE81-029853] p0033 N82-15607
Dependence of minority carrier diffusion length on	CATALITIC ACTIVITY
illumination level and temperature in single	Hydrogen generation by means of catalyzed Mg-Al
crystal and polycrystalline Si solar cells	hydrolysis
p0053 A82-13804	p0083 A82-10398
A method for experimental assessment of the	Cryogenic methane separation/catalytic
shifting approximation, with application to	hydrogasification process analysis
polysilicon solar cells effect of constant	[DE81-029123] p0093 N82-10152
series resistance	Coal hydrogenation via bonding of metallic
p0058 A82-16131	compounds to coal, part 1. Solubilization of
CASPIAN SEA	Illinois bituminous coal - the critical
Petroleum geology and resource assessment of the	importance of methylene group cleavage, part 2
middle Caspian Basin, USSR, with special	[DE81-027562] p0100 N82-11236
emphasis on the Uzen field	Transient catalytic combustor model
[DE81-029951] . p0104 N82-11518	- [NASA-CR-165324] p0142 N82-13507
CASTING	Catalytic effect of iron in hydrogasification of
Silicon solar cell process development,	coal
fabrication and analysis	· [DE81-023928] p0113 N82-14323
[NASA-CR-163787] p0063 N82-10500	Exploratory study of coal-conversion chemistry
CATALYSIS poulos noz-10500	[DE81-016136] p0119 N82-15552
Chemistry of lignite liquefaction	CATASTROPHE THEORY
[DE81-030178] p0093 N82-10249	Is geothermal simulation a catastrophe?
Transportation fuels from synthetic gas	[DE81-026750] p0105 N82-11588
[DE81-029614] p0102 N82-11258	CAVITY RESONATORS
Chemistry and catalysis of coal liquefaction:	High efficiency SPS klystron design
Catalytic and thermal urgrading of coal liquid	p0148 N82-12552
and hydrogenation of CO to produce fuels	Analytic investigation of efficiency and
[DOE/ET-14700/1] p0102 N82-11259	performance limits in klystron amplifiers using
Chemistry and catalysis of coal liquefaction:	multidimensional computer programs; multi-stage
Catalytic and thermal upgrading of coal liquid	depressed collectors; and thermionic cathode
and hydrogenation of CO to produce fuels	life studies
[DOE/ET-14700/2] p0102 N82-11260	p0148 N82-12553
Selective separation of coal feedstocks for	The Resonant Cavity Radiator (RCR)
conversion by magnetic separation techniques	p0148 N82-12556
[DE81-028060] p0108 N82-12263	CELL ANODES
CATALISTS	· Photocorrosion of strontium titanate photoanodes
Desulfurization with transition metal catalysts	p0057 A82-16056
[DE81-028935] p0092 N82-10143	Calcium/metal sulfide battery development program
Liquefaction of bituminous coals using disposal	[ANL-81-14] p0158 N82-11578
ore catalysts and hydrogen	Electrodes and diaphragms for fuel cells
[DE81-029134] p0093 N82-10154	[BMFT-FB-T-81-047] p0143 N82-14666
Chemistry and morphology of coal liquefaction	CBLL CATHODES
[DE81-028899] p0095 N82-10264	Rechargeable lithium/vanadium oxide cells
Kinetics and catalysis of producing synthetic	utilizing 2Me-THP/LiAsP6
gases from biomass	p0154 A82-15726
[PB81-217614] pC095 N82-10272	Electrodes and diaphragms for fuel cells
Assessment of advanced coal gasification processes	[BMFT-FB-T-81-047] p0143 N82-14666
[NASA-CR-164949] p0098 N82-11146	CELLS (BIOLOGY)
Catalyst and reactor development for a	Progress report to the Department of Energy in
liquid-phase fischer-tropsch process	support of basic energy and policy research'
[DE81-028209] p0099 N82-11168	[DE81-025882] p0028 N82-14648
An evaluation of three-way control single and dual	CELLULOSE
bed catalysts as applied to heavy-duty gasoline	Partial acid hydrolysis pretreatment for enzymatic
engines	hydrolysis of cellulose: A process development
[PB81-224982] p0012 N82-11477	study of ethanol production
Catalytic hydrogenation of coal-derived liquids	p0107 N82-12236
[DE81-030485] p0106 N82-12198	CEMENTS
Development of a process for recovery of valuable	Construction of a recycled Portland cement '
components from complex hydrodesulfurization	concrete pavement Connecticut expressway
catalysts especially tungsten, mclybdenum,	
catalyses especially tungsten, melybuenum,	
vanadium, nickel and cobalt	Dimensions, volume 65, number 3
[BMFT-FB-T-80-186] p0016 N82-12204	[PB81-235053] p0161 N82-15436 CENSUS
Thermal processing of used catalysts	LEBNUS
[BHFT-FB-T-80-189] p0016 N82-12205	
	Puels and electric energy consumed
Development of catalytic systems for the	• Fuels and electric energy consumed [PB81-240442] p0032 N82-15594
conversion of syngas to jet fuel and diesel fuel	• Fuels and electric energy consumed [PB81-240442] p0032 N82-15594 CENTRAL AMBRICA
conversion of syngas to jet fuel and diesel fuel and higher alcohols	Fuels and electric energy consumed [PB81-240442] p0032 N82-15594 CENTRAL AMBRICA Energy and development in Central America. Volume
conversion of syngas to jet fuel and diesel fuel and higher alcohols [DE82-000067] p0108 N82-12255	Fuels and electric energy consumed [FB81-240442] p0032 N82-15594 CEBTRAL AMBRICA Energy and development in Central America. Volume 1: Regional assessment
conversion of syngas to jet fuel and diesel fuel and higher alcohols [DE82-000067] p0108 N82-12255 Synthesis gas conversion to liquid fuels using	Fuels and electric energy consumed [PB81-240442] p0032 N82-15594 CENTRAL AMERICA Energy and development in Central America. Volume 1: Regional assessment [PB81-231540] p0032 N82-15589
conversion of syngas to jet fuel and diesel fuel and higher alcohols [DE82-000067] p0108 N82-12255	Fuels and electric energy consumed [FB81-240442] p0032 N82-15594 CEBTRAL AMBRICA Energy and development in Central America. Volume 1: Regional assessment
conversion of syngas to jet fuel and diesel fuel and higher alcohols [DE82-000067] p0108 N82-12255 Synthesis gas conversion to liquid fuels using	Fuels and electric energy consumed [PB81-240442] p0032 N82-15594 CENTRAL AMERICA Energy and development in Central America. Volume 1: Regional assessment [PB81-231540] p0032 N82-15589
conversion of syngas to jet fuel and diesel fuel and higher alcohols [DE82-000067] p0108 M82-12255 Synthesis gas conversion to liquid fuels using promoted fused iron catalysts [DE81-030857] p0108 M82-12259	Puels and electric energy consumed [PB81-240442] p0032 N82-15594 CENTRAL AMERICA Energy and development in Central America. Volume 1: Regional assessment [PB81-231540] p0032 N82-15589 Energy and development in Central America. Volume
conversion of syngas to jet fuel and diesel fuel and higher alcohols [DE82-000067] p0108 N82-12255 Synthesis gas conversion to liquid fuels using promoted fused iron catalysts [DE81-030857] p0108 N82-12259 Control of hydrocarbons and carbon monoxide via	Fuels and electric energy consumed [FB81-240442] p0032 N82-15594 CEBTRAL AMBRICA Energy and development in Central America. Volume 1: Regional assessment [FB81-231540] p0032 N82-15589 Energy and development in Central America./ Volume 2: Country assessments
conversion of syngas to jet fuel and diesel fuel and higher alcohols [DE82-000067] p0108 N82-12255 Synthesis gas conversion to liquid fuels using promoted fused iron catalysts [DE81-030857] p0108 N82-12259 Control of hydrocarbons and carbon monoxide via catalytic incineration	Fuels and electric energy consumed [FB81-240442] p0032 N82-15594 CENTRAL AMERICA Energy and development in Central America. Volume 1: Regional assessment [FB81-231540] p0032 N82-15589 Energy and development in Central America., Volume 2: Country assessments [FB81-231557] p0032 N82-15590
conversion of syngas to jet fuel and diesel fuel and higher alcohols [DE82-000067] p0108 N82-12255 Synthesis gas conversion to liquid fuels using promoted fused iron catalysts [DE81-030857] p0108 N82-12259 Control of hydrocarbons and carbon monoxide via catalytic incineration	Fuels and electric energy consumed [FB81-240442] p0032 N82-15594 CENTRAL AMERICA Energy and development in Central America. Volume 1: Regional assessment [PB81-231540] p0032 N82-15589 Energy and development in Central America./ Volume 2: Country assessments [PB81-231557] p0032 N82-15590 CENTRIPUGING
conversion of syngas to jet fuel and diesel fuel and higher alcohols [DE82-000067] p0108 N82-12255 Synthesis gas conversion to liquid fuels using promoted fused iron catalysts [DE81-030857] p0108 N82-12259 Control of hydrocarbons and carbon monoxide via catalytic incineration	Fuels and electric energy consumed [FB81-240442] p0032 N82-15594 CENTRAL AMERICA Energy and development in Central America. Volume 1: Regional assessment [FB81-231540] p0032 N82-15589 Energy and development in Central America. Volume 2: Country assessments [FB81-231557] p0032 N82-15590 CENTRIFUGING Cyclone performance estimates for pressurized

SUBJECT INDEX CHEMICAL BRACTORS

CERABIC CONTINGS	CHEMICAL COMPOSITION
metallurgical coatings 1980; Proceedings of the	Optimization of the composition and antidetonation
Seventh International Conference, San Diego, CA,	properties of AI-93 gasoline
April 21-25, 1980. Volumes 1 & 2	p0091 A82-15722
p0161 A82-17251 MAD oxidant intermediate temperature ceramic	Chemistry of lignite liquefaction [DB81-030178] p0093 N82-10249
heater study	Effects of components of synfuels on soot formation
[NASA-CR-165453] P0144 N82-15527	[DB81-027961] p0101 N82-11242
CERAMICS	CHEMICAL RIBMENTS
Use of ceramics in point-focus solar receivers [AIAA PAPER 81-2552] p0054 A82-14015	Blemental composition of atmospheric fine-particles emitted from coal burned in a
Ceramics for the AGT101 automotive gas turbine	modern electric power plant equipped with a
p0132 A82-16827	flue-gas desulfurization system
Energy and ceramics Book	[DB81-030073] p0033 N82-15610
p0005 A82-17076	CHEMICAL ENGINEERING
Low cost silicon-on-ceramic photovoltaic solar cells p0059 A82-17098	Field demonstration of the conventional steam drive process with ancillary materials
The use of semiconducting oxide Ceramics in solar	[DE81-026849] p0115 H82-14522
energy conversion	Field demonstration of the conventional steam
p0059 A82-17099	drive process with ancillary materials
US ceramic heat exchanger technology: Status and	[DB81-026962] p0115 N82-14523
opportunities [DB81-029686] p0030 N82-15210	CHEMICAL RQUILIBRIUM One-dimensional equilibrium-chemistry flow model
[DEST-029686] PU030 NS2-15210 CRSIUM PLASMA	for coal combustors
The plasmadynamics and ionization kinetics of	[DE81-027622] p0099 N82-11158
thermionic energy conversion	CHEMICAL PROPERTIES
p0137 N82-10494	Development of hydroconversion of biomass to
Study of radiatively sustained cesium plasmas for solar energy conversion	synthetic fuels [DB81-030954] p0108 N82-12260
[NASA-CR-166265] p0075 N82-13039	Solar-central-receiver fuels and chemicals
CETANE	[DB82-000941] p0077 N82-13530
Characterization of diesel emissions as a function	CHEMICAL REACTIONS
of fuel variables	The application of reversible chemical reactions
[PB81-244048] p0118 N82-15233 CHANNEL PLOW	to solar thermal energy systems
Field demonstration of the conventional steam	p0038 A82-10020 Model calculations of the chemical processes
drive process with ancillary materials	occurring in the plume of a coal-fired power plant
[DE81-026849] p0115 N82-14522	p0005 A82-16342
Pield demonstration of the conventional steam	Chemistry and morphology of coal liquefaction
drive process with ancillary materials [DE81-026962] p0115 N82-14523	[DE81-028899] p0095 N82-10264
[DE81-026962] p0115 N82-14523 CHARACTERIZATION	Vertical combustor for refuse combustion [DE81-030002] p0098 N82-11152
Crystallized fly-ash feasibility study	Investigation of mechanisms of hydrogen transfer
[EPRI-EL-1836] p0009 N82-10599	in coal hydrogenation
CHARGE CABRIERS	[DE81-030492] p0099 N82-11165
Field nonuniformity due to photogenerated carriers	Chemical heat pump program: An overview
in a p-1-n solar cell p0060 A82-17650	[DE81-025086] p0012 N82-11414 Coal combustion in high convective flows
CHARGE DISTRIBUTION	[DE81-030391] p0106 N82-12194
Investigation of the zinc electrode reaction	Pyrolysis of coal-drived fuels using the
nickel zinc batteries	laser-powered homogeneous pyrolysis technique
[DE81-030221] p0157 N82-11368	[DB82-000251] p0106 N82-12196
CHARBING The corrosion of some superalloys in contact with	Oxydesulfurization of coal by acidic iron sulfate solutions
coal chars in coal gasifier atmospheres	[DE82-000464] p0106 N82-12199
, p0091 A82-17974	Investigation of factors affecting the in-situ
CHEMICAL ANALYSIS	combustion retorting of oil shale
Comparison of Michigan Basin crude oils	[DB82-000482] p0106 N82-12200
p0091 A82-17007	Development of a metal hydride process for
Techniques for geothermal liquid sampling and analysis	hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382
[DE81-030151] p0098 N82-11149	Mathematical modelling of some chemical and
Development and application of analytical	physical processes in underground coal
techniques to chemistry of donor solvent	gasification
liquefaction [DE81-029125] p0099 N82-11166	[DE81-027941] p0116 N82-14613 CHEMICAL REACTORS
Development and application of analytical .	An experimental study of SO3 dissociation as a
techniques to chemistry of donor solvent	mechanism for converting and transporting solar
liquefaction	energy
[DE81-025961] p0099 N82-11167	p0043 A82-11214
Informational report on the measurement and characterization of diesel exhaust emissions	Pluidized bed coal combustion reactor [NASA-CASE-NPO-14273-1] p0097 N82-11144
[PB81-221251] p0009 B82-11175	Catalyst and reactor development for a
Survey of particulate emission macro- and	liquid-phase fischer-tropsch process
micro-sampling and sizing methods	[DE81-028209] p0099 N82-11168
[DE81-028348] p0014 N82-11642	Solar coal-gasification reactor for
Peat deposits of Dismal Swamp pocosins: Camden,	hydrocarbon-free synthesis gas
Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina	[DE81-026600] p0067 N82-11247 Kinetics of NO/ sub x formation during early
[DE81-029642] p0109 N82-12524	stages of pulverized-coal combustion
Chemical element concentrations in liquids and	[DB81-029071] p0014 N82-11641
solids associated with power plants using FGD	Interactive model to assess economics of anaerobic
Systems -0007 NOO 40300	digestion of the farm
[DE81-030422] p0027 M82-14322 Oil spill identification by chemical analysis	[DE82-000452] p0110 N82-12620 Controlled-flash pyrolysis
p0115 N82-14583	[DE82-000284] p0111 N82-13196
Hotor gasolines, winter 1980-81	Puels and chemicals made from solar energy
[DE81-030845] p0117 N82-15224	[DE81-025018] p0077 N82-14384

CHEMICAL TESTS SUBJECT INDEX

CHEMICAL TESTS	CLEABING
Testing and evaluation of MED materials and	Process for removing sulfur oxides from gases with
substructures [DE81-024331] p0143 %82-13926	direct production of a usable finished reaction product ammonium sulfate fertilizer
CHIPS (ELECTRODICS)	[BHFT-FB-T-81-102] p0029 N82-15142
Multijunction high voltage concentrator solar cells p0047 A82-11796	CLIMATE Effects of atmospheric variability on energy
CHLORINATION	utilization and conservation '
Coal desulfurization by low temperature	[DB81-026308] p0008 N82-10592
Chlorinolysis, phase 3 [NASA-CR-164957] p0098 N82-11145	Oceans and ocean currents: Their influence on climate
Hydrodesulfurization of chlorinated coal	[DE81-027263] p0016 N82-11731
[MASA-CASE-NPO-15304-1] p0107 N82-12240 Plat-plate solar array project. Task 1: Silicon	Meteorological and climatological investigation: Review of January - June 1980 investigative period
material: Investigation of the	[DE81-030740] p0111 N82-12731
hydrochlorination of SiC1sub4	CLIMBING PLIGHT
[NASA-CR-165042] p0078 N82-14631 CHLOROSILANES	Energy savings with today's technology alroraft fuel management through in-flight
Plat-plate solar array project. Task 1: Silicon	monitoring
material: Investigation of the hydrochlorination of SiC1sub4	p0005 A82-17282 CLOUD COVER
[NASA-CR-165042] p0078 N82-14631	The effect of non-Markovian cloud patterns on the
CHRONIUM	design of a regulator for a solar-powered bouler
Enhancement of methane gas production using an industrial waste in anaerobic digestion	p0052 A82-13083
effects of chrome shavings from leather tanning	Fracture flow of groundwater in coal-bearing strata
[DE81-023819] p0095 N82-10267	[DE81-023810] p0096 N82-10479 Study of the formation of submicron particulates
Performance of advanced chromium electrodes for the NASA Redox Energy Storage System	generated by coal combustion
[NASA-TH-82724] p0159 N82-12574	[DE81-027447] p0008 N82-10586
Optical properties of selectively absorbing	Coal fly ash: A review of the literature and proposed classification system with emphasis on
chromium films deposited at oblique angle of	en vironmental impacts
incidence	[PB81-215014] p0009 N82-10608 Coal desulfurization by low temperature
p0040 A82-10467 Metallurgical analysis and high temperature	chlorinolysis, phase 3
degradation of the black chrome solar selective	[NASA-CR-164957] p0098 N82-11145
absorber p0060 A82-17252	Computational tools for pulverized-coal combustion [DE81-028582] p0098 N82-11148
Oxidation of electrodeposited black chrome	One-dimensional equilibrium-chemistry flow model
selective solar absorber films	for coal combustors
P0060 A82-17255 CIRCUIT PROTECTION	[DE81-027622] p0099 N82-11158 Laboratory study for removal of organic sulfur
Distributed photovoltaic systems: Utility	from coal
interface issues and their present status [NASA-CR-165019] p0076 N82-13492	[DE81-025132] p0010 M82-11239 Low/medium-Btu coal-gasification assessment .
CIRCULAR TUBES	program for specific sites of two New York
Experimental and analytical investigation of a	utilities
fluidic power generator [JPL-PUB-81-100] p0142 N82-13386	[DE81-025518] p0101 N82-11240 Controlled Retracting Injection Point (CRIP)
CITIES	system: A modified-stream method for in situ
An energy saving transit concept for new towns p0005 A82-15665	coal gasification [DE81-026477] p0102 N82-11248
CLADDING	Transport characteristics of alternate slurry fuels
Asymmetric stress and failure analysis	[DE81-028580] p0146 N82-11255
[DE81-026842] p0142 N82-13451 CLEAN ENERGY	Gas recovery from coal deposits [PB81-222291] p0103 N82-11271
A vertical axis cyclogiro type wind-turbine with	Coal gasifier parameters influencing environmental
freely-hinged blades p0125 A82-11829	pollutant production [PB81-221301] p0011 N82-11273
Siting and land-use considerations in wind energy	Geologic considerations in underground coal mining
development	system design
[AIAA PAPER 81-2541] p0003 A82-14009 Cost estimates for advanced/innovative wind energy	[NASA-CR-164961] p0104 N82-11516 Planning a comprehensive program for exploration
conversion systems /AWECS/	of the anthracite deposits of the Narragansett
[AIAA PAPER 81-2557] p0128 A82-14016 A modular simulation model for a wind turbine system	Basin of Massachusetts and Rhode Island, phase 1 and 2
[AIAA PAPER 81-2558] p0128 A82-14017	[DE81-028490] p0104 N82-11519
An analytic model of high solidity vertical axis	Exploration of coal and anthracitic carbonaceous
windmills p0131 A82-14360	snale resources, Narragansett Basin, Massachusetts, and Rhode Island
Energy technology VIII: New fuels era; Proceedings	[DE81-030895] p0104 N82-11523
of the Eighth Conference, Washington, DC, March 9-11, 1981	Energy analysis of human ecosystems in an Appalachian coal county
p0004 A82-14925	[DE81-025177] p0013 N82-11574
The electric utility 4.5 MW fuel cell power plant - An urban demonstration	Development, testing, and evaluation of MHD materials and component designs. Volume 1:
p0131 A82-15070	Executive summary
Energy for the year 2000 Book	[DE81-026203] p0139 N82-11947
p0006 A82-18120 Environmental and economic comparison of advanced	Assessment of pulverized-coal-fired combustor performance
processes for conversion of coal and biomass	[DE81-030860] p0105 N82-12187
into clean energy [PB81-234239]	Coal combustion in high convective flows [DE81-030391] p0106 N82-12194
Indoor air quality	Solvent-Refined Coal (SRC) process
[DE81-029857] p0033 N82-15611	[DE81-031937] p0106 N82-12197
Heavy-duty engine baseline program and NO sub x emission standard development (1972-73)	Oxydesulfurization of coal by acidic iron sulfate solutions
[PB81-244030] p0034 N82-15621	[DE82-000464] p0106 N82-12199

SUBJECT INDEX COAL GASIFICATION

Supercritical multicomponent solvent coal extraction	Catalytic hydrogenation of coal-derived liquids
[NASA-CASE-NPO-15767-1] p0107 N82-12241	[DE81-030485] p0106 N82-12198
Selective separation of coal feedstocks for	Measurement of thermal conductivities in coal fluids
conversion by magnetic separation techniques	[DE82-000523] p0109 N82-12400
[DE81-028060] p0108 N82-12263	Development of a thermodynamic properties
Designing process wells for an underground	correlation framework for the coal conversion
coal-qasification environment	industry, phase 1A
[DE81-028434] p0108 N82-12264	[DE81-030363] p0111 N82-12985
Evaluation of novel underground transport systems	Potential supply of synthetic fuels from Alaskan
[DE81-030279] p0146 N82-12520	hydroelectric power and coal
Peasibility analysis of trench strip and auger	[DE81-025743] p0114 N82-14381
nining	COAL GASIFICATION
[DE81-027557] p0017 N82-12521	Fingerprinting pollutant discharges from synfuels
Extensible bridge-conveyor concepts for coal-mine	plants
	p0001 A82-10697
face haulage	
[DB81-031974] p0146 N82-12525	Present status of Florida Power Corporation's
Power-plant fly-ash utilization: A	D.O.E. funded feasibility study of the Higgins
chemical-processing perspective	plant repowering/coal gasification project
[DE81-025452] p0022 N82-13191	p0089 A82-11834
Controlled-flash pyrolysis	Status report on Central Maine Power Company's DOE
[DE82-000284] p0111 N82-13196	Punded feasibility study of the Sears Island
Environmental and economic comparison of advanced	integrated gasification combined cycle power plant
processes for conversion of coal and biomass	p0089 A82-11835
into clean energy	An overview of peat gasification
[PB81-234239] p0023 N82-13256	p0089 A82-11848
Water and energy usage in coal preparation	Assessment of MHD power plants with coal
[PB81-238248] p0112 N82-13486	gasification
Environmental effects of pollutants from coal	[AIAA PAPER 81-2574] p0129 A82-14030
combustion. 2: The Colstrip, Montana Power Plant	The corrosion of some superalloys in contact with
[PB81-234114] p0026 N82-13573	coal chars in coal gasifier atmospheres
Pyrolytic characterization of the organic matter	p0091 A82-17974
in selected coals and in the Devonian shales of	Kinetics and mechanisms of catalytic
southern West Virginia	hydroliquefaction and hydrogasification of lignite
p0113 N82-13578	[DE81-023581] p0092 N82-10144
Chemical element concentrations in liquids and	Cryogenic methane separation/catalytic
solids associated with power plants using PGD	hydrogasification process analysis
systems	[DE81-029123] p0093 N82-10152
[DE81-030422] p0027 N82-14322	Particulate processes in pulverized-coal flames
Catalytic effect of iron in hydrogasification of	
coal	Molten-salt coal-gasification process development
[DE81-023928] p0113 N82-14323	unit, phase 2
Longwall mining of thin seams	[DE81-023585] p0094 N82-10251
[DE81-028042] p0116 N82-14612	Underground gasification of steeply dipping beds.
International energy indicators	Phase 2 report: Results of Rawlins test No. 1
[DE81-028117] p0028 N82-14653	[DE81-028581] p0094 N82-10255
Value tree analysis of energy supply alternatives	High-mass-flux coal gasifier
Moorhead district heating, phase 2	Experimental evaluation of the steady-state and
[DE81-029689] p0031 N82-15556	dynamic performance characteristics of the
COAL DERIVED GASES	interactive units of a coal-gasification process
Present status of Florida Fower Corporation's	[DE81-028995] p0094 N82-10259
D.O.E. funded feasibility study of the Higgins	Pricetown 1 underground coal gasification field
plant repowering/coal gasification project	test: Operations report
p0089 A82-11834	[DE81-025162] p0095 N82-10268
Peasibility and economic study of medium-BTU coal	Key contributions in MHD power generation
qas blended with high-BTU by product gas as an	[DE81-028121] p0138 N82-10882
industrial energy source at Billings, Montana	Assessment of advanced coal gasification processes
[DE81-025166] p0101 N82-11237	[NASA-CR-164949] p0098 N82-11146
Low/medium-Btu coal-gasification assessment	Materials technology for coal-conversion processes
program for specific sites of two New York	[DE81-028474] p0100 882-11169
utilities	Alternative fuel for the steel industry of
[DE81-025518] p0101 N82-11240	Northern Indiana: A prefeasibility study of a
Solar coal-gasification reactor for	central coal gasification project
hydrocarbon-free synthesis gas	[DE81-029314] p0010 N82-11233
[DE81-026600] p0067 N82-11247	Conceptual design for a multi-user medium BTU coal
Peasibility and economic study of medium-Btu coal	gasification complex. Volume 1: Executive
gas blended with high-Btu by-product gas as an	summary
industrial energy source at Billings, Montana	[DE81-027139] p0101 N82-11238
[DB81-030622] p0107 N82-12254	Low/medium-Btu coal-gasification assessment
COAL DERIVED LIQUIDS	program for specific sites of two New York
Production of synthetic crude oil from coal using	utilities
the TOSCOAL pyrolysis process	[DE81-025518] p0101 N82-11240
p0090 A82-11849	Solar coal-gasification reactor for
Separation of particles from coal derived liquids	hydrocarbon-free synthesis qas
via surface charge properties	[DB81-026600] p0067 N82-11247
[DB81-029088] p0092 N82-10141	Controlled Retracting Injection Point (CRIP)
Desulfurization with transition metal catalysts	system: A modified-stream method for in situ
[DB81-028935] p0092 N82-10143	coal gasification
Liquid fossil fuel technology	[DB81-026477] p0102 N82-11248
[DE81-029912] p0094 H82-10250	Surface coal gasification
Effects of components of synfuels on soot formation	[DE81-030183] p0102 N82-11253
	Advanced-gasification processes
Solid and hazardous energy wastes: Synfuels, 1:	. [DB81-030184] p0102 W82-11254
Review of research activities	LLNL underground coal gasification project
[DB81-028503] p0014 N82-11644	[DE81-030634] p0103 N82-11267
Pyrolysis of coal-drived fuels using the	Coal gasifier parameters influencing environmental
laser-powered homogeneous pyrolysis technique	pollutant production
[DE82-000251] p0106 882-12196	[PB81-221301] p0011 N82-11273
	A SECTION AND A

Namel design of processors records and thormal	Chamister of lignita lignofaction
Novel design of pressure vessels and thermal	Chemistry of lignite liquefaction [DB81-030178] p0093 N82-10249
shields in coal gasifiers [DB81-025828] p0104 B82-11474	E-coal process improvement study. Bench unit
[DB81-025828] p0104 M82-11474 Great Plains gasification project, Mercer County,	baseline run with preheater/reactor
North Dakota; water assessment report section	[DB81-026022] p0094 N82-10260
13 (c)	Chemistry and morphology of coal liquefaction
[PB81-216111] p0013 N82-11524	[DB81-028899] p0095 H82-10264
Great Plains gasification project, Mercer County,	Thermophysical properties of coal liquids
North Dakota: water assessment report	[DE81-0279446] p0097 N82-10938
[PB81-216129] p0013 N82-11525	Enthalpy measurement of coal-derived liquids
Low-Btu-gasifier emissions toxicology	[DE81-029481] p0097 N82-10939
[DB81-031000] p0014 N82-11651	Investigation of mechanisms of hydrogen transfer
Vapor-phase cracking and wet oxidation as	in coal hydrogenation
potential pollutant control techniques for coal	[DB81-030492] p0099 N82-11165
gasification	Development and application of analytical
[PB81-219594] p0015 N82-11661	techniques to chemistry of donor solvent
Computer models to support investigations of	liquefaction
surface subsidence and associated ground motion	[DE81-029125] p0099 N82-11166
induced by underground coal gasification	Development and application of analytical
[DB81-027131] p0015 N82-11712	techniques to chemistry of donor solvent
Solid-solid reactions in coal conversion processes	liquefaction
p0107 B82-12238	[DE81-025961] p0099 H82-11167
Status of the Great Plains coal gasification plant	Catalyst and reactor development for a
[BMD-81-64] p0107 N82-12242	liquid-phase fischer-tropsch process
Fixed-bed gasification	[DB81-028209] p0099'N82-11168
[DB82-000432] p0108 N82-12261	Materials technology for coal-conversion processes
Density-measurement studies at the BI-GAS pilot	[DB81-028474] p0100 N82-11169
plant	Coal hydrogenation via bonding of metallic
[DB82-000910] p0108 N82-12262	compounds to coal, part 1. Solubilization of
Designing process wells for an underground	Illinois bituminous coal - the critical
coal-gasification environment	importance of methylene group cleavage, part 2
[DB81-028434] p0108 N82-12264	[DB81-027562] p0100 N82-11236
Assessment of water supply contamination due to	Solvent-Refined Coal-1 Demonstration Project.
underground coal gasification	Pinal environmental impact statement, Volume 1
[PB81-209215] p0021 N82-12680	of 2 coal liquefaction plant at Newman,
Soviet UCG experience specifically related to field experiments in the United States	Kentucky [DE81-025983] p0010 N82-11252
[DE81-028642] p0111 N82-13244	Advanced-gasification processes
Low/medium Btm coal gasification assessment	[DE81-030184] p0102 M82-11254
program for potential users in New Jersey:	Chemistry and catalysis of coal liquefaction:
Executive summary	Catalytic and thermal upgrading of coal liquid
[DE81-025475] p0111 N82-13247	and hydrogenation of CO to produce fuels
Low-Btu gasification of coal for electric power	[DOE/ET-14700/1] p0102 N82-11259
generation, phase 1, 2, and 3	Chemistry and catalysis of coal liquefaction:
[DB81-029482] p0112 N82-13248	Catalytic and thermal upgrading of coal liquid
Solar-central-receiver fuels and chemicals	and hydrogenation of CO to produce fuels
[DE82-000941] p0077 #82-13530	[DOE/ET-14700/2] p0102 N82-11260
Environmental hazard rankings of pollutants	Coal liquefaction demonstration plant near
generated in coal gasification processes	Morgantown, West Virginia; water assessment
[PB81-231698] p0026 N82-13576	report section 13(b)
Catalytic effect of iron in hydrogasification of	[PB81-216095] p0103 N82-11269
coal	Coal liquefaction demonstration plant near
[DE81-023928] p0113 N82-14323	Morgantown, West Virginia: Water assessment
Sixth Underground Coal-Conversion Symposium	report
[DB81-027669] p0114 N82-14374	[PB81-216103] p0011 N82-11270
Puels and chemicals made from solar energy	Solvent-Refined Coal (SRC) process
[DE81-025018] p0077 N82-14384	[DB81-031937] p0106 N82-12197
Mathematical modelling of some chemical and physical processes in underground coal	Catalytic hydrogenation of coal-derived liquids [DE81-030485] p0106 N82-12198
gasification	Development of testing procedures and
[DE81-027941] p0116 N82-14613	bibliographic information relevant to the
Evaluation of coal gasification/combined cycle	testing of solid wastes resulting from synthetic
power plant feasibility at the Sevells Point	fuels production
Naval Complex, Norfolk, Virginia	[DE81-030822] p0020 N82-12661
[AD-A103674] p0116 H82-14639	Kinetics of wet oxidation of biological sludges
Coal conversion solid waste disposal	from coal-conversion wastewater treatment
[DE81-028567] p0116 N82-14680	[DB82-000525] p0021 N82-12674
Real-time coarse-particle mass measurements in a	Controlled-flash pyrolysis
high-temperature/pressure coal-gasifier process	[DE82-000284] p0111 N82-13196
treatment	H-Coal product physical properties measurement
[DB81-030039] p0119 N82-15604	[DB81-029095] p0111 H82-13245
Real time coarse particle mass measurements in a	Environmental and economic comparison of advanced
	processes for conversion of coal and biomass
high temperature and pressure coal gasifier	
process treatment	into cleam energy
process treatment [DE81-030036] p0033 N82-15609	into cleam energy [PB81-234239] p0023 N82-13256
process treatment [DE81-030036] p0033 N82-15609 Symposium proceedings: Environmental aspects of	into clean energy [PB81-234239] Process development for improved SBC options.
process treatment [DE81-030036] p0033 M82-15609 Symposium proceedings: Environmental aspects of fuel conversion technology, 5th	into clean energy [PB81-234239] Process development for improved SBC options. Rerr-McGee critical solvent deashing and
process treatment [DE81-030036] Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 882-15623	into clean energy [PB81-234239] Process development for improved SBC options. Kerr-McGee critical solvent deashing and fractionation studies
process treatment [DE81-030036] Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] COAL LIQUEFACTION	into clean energy [PB81-234239] Process development for improved SRC options. Rerr-McGee critical solvent deashing and fractionation studies [DE81-903785] p0114 M82-14380
process treatment [DE81-030036] p0033 B82-15609 Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 B82-15623 COAL LIQUERACTION Jet fuel from carbon	into clean energy [PB81-234239] Process development for improved SRC options. Rerr-McGee critical solvent deashing and fractionation studies [DR81-903785] P0114 N82-14380 Thermolysis of naphthols
process treatment [DE81-030036] Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] COAL LIQUEFACTION	into clean energy [PB81-234239] Process development for improved SRC options. Rerr-McGee critical solvent deashing and fractionation studies [DE81-903785] p0114 M82-14380
process treatment [DE81-030036] Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] COAL LIQUEPACTION Jet fuel from carbon p0090 A82-12021	into clean energy [PB81-234239] Process development for improved SRC options. Kerr-McGee critical solvent deashing and fractionation studies [DB81-903785] Thermolysis of naphthols [DB81-029684] p0116 N82-15152
process treatment [DE81-030036] Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] COAL LIQUEFACTION Jet fuel from carbon p0090 A82-12021 U.S. Department of Energy liquid synfuels overview	into clean energy [PB81-234239] Process development for improved SEC options. Kerr-McGee critical solvent deashing and fractionation studies [DE81-903785] Thermolysis of naphthols [DE81-029684] Pailure modes and effects analysis of a coal-slurry preheater [DE81-030425] p0117 N82-15221
process treatment [DE81-030036] Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] COAL LIQUEFACTION Jet fuel from carbon p0090 A82-12021 U.S. Department of Energy liquid synfuels overview p0090 A82-12531	into clean energy [PB81-234239] Process development for improved SBC options. Kerr-McGee critical solvent deashing and fractionation studies [DB81-903785] Thermolysis of naphthols [DB81-029684] Failure modes and effects analysis of a coal-slurry preheater [DB81-030425] Exploratory study of coal-conversion chemistry
process treatment [DE81-030036] Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] COAL LIQUEFACTION Jet fuel from carbon P0090 A82-12021 U.S. Department of Energy liquid synfuels overview p0090 A82-12531 Kinetics and mechanisms of catalytic hydroliquefaction and hydrogasification of lignite [DE81-023581]	into clean energy [PB81-234239] Process development for improved SBC options. Kerr-McGee critical solvent deashing and fractionation studies [DB81-903785] Thermolysis of naphthols [DB81-029684] Pailure modes and effects analysis of a coal-slurry preheater [DB81-030425] Exploratory study of coal-conversion chemistry [DB81-016136] p0119 N82-15552
process treatment [DE81-030036] Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] COAL LIQUEFACTION Jet fuel from carbon p0090 A82-12021 U.S. Department of Energy liquid synfuels overview p0090 A82-12531 Kinetics and mechanisms of catalytic hydroliquefaction and hydrogasification of lignite [DE81-023581] Liquefaction of bituminous coals using disposal	into clean energy [PB81-234239] Process development for improved SBC options. Kerr-McGee critical solvent deashing and fractionation studies [DE81-903785] Thermolysis of naphthols [DE81-029684] Pailure modes and effects analysis of a coal-slurry preheater [DE81-030425] Exploratory study of coal-conversion chemistry [DE81-016136] Symposium proceedings: Environmental aspects of
process treatment [DE81-030036] Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] COAL LIQUEFACTION Jet fuel from carbon P0090 A82-12021 U.S. Department of Energy liquid synfuels overview p0090 A82-12531 Kinetics and mechanisms of catalytic hydroliquefaction and hydrogasification of lignite [DE81-023581]	into clean energy [PB81-234239] Process development for improved SBC options. Kerr-McGee critical solvent deashing and fractionation studies [DB81-903785] Thermolysis of naphthols [DB81-029684] Pailure modes and effects analysis of a coal-slurry preheater [DB81-030425] Exploratory study of coal-conversion chemistry [DB81-016136] p0119 N82-15552

SUBJECT INDEX

COAL OTILIZATION	COASTAL WATER
Overview of DOE's large stationary Stirling engine	Chemical and geochemical studies off the coast of
development program	Bashington
p0123 A82-11805 Conceptual design of a large coal-fired stationary	[DE81-030319] p0017 H82-12513
Stirling engine	Use of oxide decompositions in advanced
p0123 A82-11806	thermochemical hydrogen cycles for solar heat
Coal fired air turbine cogeneration	sources. Application of the tricobalt
p0089 A82-11836	tetraoxide-cobalt monoxide pair
An overview of fluidized-bed combustion /FBC/	[DE81-030235] p0082 N82-15581
design practice	CODING
p0090 A82-11850 Advances in coal fired MHD generator research	User's guide to HELIOS: A computer program for modeling the optical behavior of reflecting
p0126 A82-11853	solar concentrators. Part 1: Introduction and
Jet fuel from carbon	code input
p0090 A82-12021	[DB81-031920] p0073 N82-12616
Problems and potential for MHD retrofit of	COGENERATION
existing coal-fired plants	High temperature cogeneration with thermionic
[AIAA PAPER 81-2586] p0130 A82-14036	burners , p0124 A82-11817
Model calculations of the chemical processes occurring in the plume of a coal-fired power plant	Coal fired air turbine cogeneration
p0005 A82-16342	p0089 A82-11836
Optical diagnostic techniques for coal-fired MHD	A method for preliminary evaluation and sizing of
applications	solar thermal cogeneration system applications
[AIAA PAPEE 82-0377] p0135 A82-17913	[AIAA PAPER 81-2551] p0054 A82-14014
MED coal combustor development [AIAA PAPER 82-0380] p0135 A82-17914	Preliminary evaluation of advanced coal-based electricity-generating technologies by means of
[AIAA PAPER 82-0380] p0135 A82-17914 Pulverized-coal firing of aluminum melting furnaces	system-integration analysis
[DOE/CS-40037/T2] p0095 882-10262	[DE81-029989] p0105 N82-11573
Safety and technical optimization of belt transfer	Comparative economics of solar thermal central
points with special consideration for the	receivers
suppression of noxious and explosive dusts	[DB81-029623] p0072 N82-12601
in coal plants [BMPT-PB-HA-80-048] p0096 N82-10279	Basis for research proposals concerning (industrial) solar energy production processes
[BMFT-FB-HA-80-048] p0096 N82-10279 Methodology for determining the impact of	derived from biological principles
environmental regulatory programs	p0075 N82-12640
[DE81-903429] p0009 N82-10594	Evaluation of coal gasification/combined cycle
Economic and environmental tradeoffs in coal	power plant feasibility at the Sewells Point
CONVERSION	Naval Complex, Norfolk, Virginia
[CONF-800608-8] p0009 N82-10598	[AD-A103674] p0116 N82-14639
High pressure BHD coal combustors investigation, phase 2	Analysis of potential cogeneration impacts on electricity generation by the Central Maine
[DE81-027238] p0138 N82-10888	Power Company
Fluidized bed coal combustion reactor	[DE81-029991] p0028 N82-14650
[NASA-CASE-NPO-14273-1] p0097 N82-11144	Moorhead district heating, phase 2
Tennessee Valley Authority atmospheric	[DB81-029689] p0031 N82-15556
fluidized-bed combustor simulation [DE81-030262] p0098 N82-11151	COLD WORKING Residual stresses in darrieus vertical axis wind
[DE81-030262] p0098 N82-11151 Possible use of coal in Hawaii, 1980 - 2000	turbine blades
[DE81-028266] p0010 N82-11263	[DE81-1026144] p0136 N82-10434
Lewis Research Center's coal-fired, pressurized,	COLLIBATION
fluidized-bed reactor test facility	SPS large array simulation
[NASA-TH-81616] p0103 N82-11397	p0071 N82-12540
National coal-market conditions for the year 2000: . Regional-issue identification and analysis, high	An active alignment scheme for the MPTS array p0147 N82-12541
scenario	Proposed experimental studies for assessing
[DE81-026425] p0016 N82-11988	ionospheric perturbations on SPS uplink pilot
Fuel nitrogen conversion during fuel rich	beam signal
combustion of pulverized coal and char	p0147 N82-12543
p0105 N82-12156	An interferometer-based phase control system
Industrial application of fluidized-bed combustion [DE81-030272] p0105 N82-12182	p0147 N82-12547 SPS phase control studies
Hydrodesulfurization of chlorinated coal	p0147 N82-12549
[NASA-CASE-NPO-15304-1] p0107 N82-12240	SPS fiber optic link assessment
A computer simulation modeling study to predict	p0147 N82-12550
air quality impacts from a 500 MW coal-fired	COLLOIDS
power plant	Colloidally deposited high-temperature solar selective surfaces
p0020 M82-12650 Preliminary study: Use of low-sulfur coal and	p0055 A82-15439
coal cleaning in control of acid rain	COLORADO
[DB81-028930] p0021 N82-12675	Solar project description for Colorado Sunworks:
Coal-oil mixtures: An alternative fuel for the	Single family
commercial markets and large residential markets	[DB81-028054] p0064 N82-10510
[DE81-028335] p0114 N82-14379 Coal and limestone feed testing for atmospheric	Gas recovery from coal deposits
fluidized bed combustion	[PB81-222291] p0103 N82-11271 Geology of the nabcolite deposits and associated
[DE81-030629] p0117 N82-15222	oil shales of the Green River Pormation in the
Coal resources and sulphur emission regulations:	Piceance Creek Basin, Colorado
A summary of 8 eastern and midwestern states	p0105 N82-11683
[PB81-240319] p0031 N82-15514	COMBINED CYCLE POWER GENERATION
Use of coal cleaning for compliance with SO2 emission regulations	Thermionic combustor application to combined gas
[PB81-247520] p0034 H82-15618	and steam turbine power plants p0124 A82-11818
COASTAL CURRENTS	'Status report on Central Maine Power Company's DOE
Turbines in the ocean	Funded feasibility study of the Sears Island
p0132 A82-16844	integrated gasification combined cycle power plant
	p0089 A82-11835

Cyclone performance estimates for pressurized	COMBUSTION CONTROL
fluidized-bed combustion combined cycle	Controlled Retracting Injection Point (CRIP)
power generation [DE81-028504] p0093 N82-10156	system: A modified-stream method for in situ coal gasification
[DE81-028504] p0093 N82-10156 Water-cooled gas turbine development program	[DE81-026477] p0102 N82-11248
[DE81-904245] p0136 N82-10406	COMBUSTION EPPICIENCY
Studies of the regeneration of activated bauxite	An overview of fluidized-bed combustion /FBC/
used as granular sorbent for the control of	design practice
alkalı vapors from hot flue gas of coal combustion [DE81-030192] p0008 N82-10590	p0090 A82-11850
[DE81-030192] p0008 N82-10590 Investigation and research of specific	Coal combustion in high convective flows [DE81-030391] p0106 B82-12194
combustion-turbine and combined-cycle field	COMBUSTION PHYSICS
problems	Characteristics of combustion and pollutant
[DB81-904231] p0141 N82-12592	formation in swirling flames
Cost goals for a residential photovoltaic/thermal	p0001 A82-10875
liquid collector system set in three northern locations	Soot formation in synthetic fuel droplets [DE81-028391] p0092 N82-10150
[DB81-029700] p0073 N82-12610	Vertical combustor for refuse combustion
COMBUSTION	[DE81-030002] p0098 N82-11152
Pulverized-coal firing of aluminum melting furnaces	Rinetics of NO/ sub x formation during early
[DOB/CS-40037/T2] p0095 N82-10262	stages of pulverized-coal combustion
Computational tools for pulverized-coal combustion [DE81-028582] p0098 N82-11148	[DE81-029071] p0014 M82-11641 Development, testing, and evaluation of MHD
Algorithm for computing in-situ combustion oil	materials and component designs. Volume 1:
recovery performance	Executive summary
[DB81-030340] p0098 N82-11153	[DE81-026203] p0139 N82-11947
One-dimensional equilibrium-chemistry flow model	COMBUSTION PRODUCTS
for coal combustors [DE81-027622] p0099 N82-11158	Characteristics of combustion and pollutant formation in swirling flames
Controlled Retracting Injection Point (CRIP)	p0001 A82-10875
system: A modified-stream method for in situ	Study of the electric conductivity of plasma from
coal gasification	fuel combustion products containing a weakly
[DE81-026477] p0102 N82-11248	ionizing impurity
Control of utility boiler and gas turbine pollutant emissions by combustion modification,	p0091 A82-12888 Dimethyl sulfate in particulate matter from coal-
phase 2	and oil-fired power plants
[PB81-222267] p0015 N82-11654	p0005 A82-16199
Coal combustion in high convective flows	Synthetic-fuel combustion; pollutant formation.
[DE81-030391] p0106 N82-12194 COMBUSTION CHAMBERS	Soot-initiation mechanisms in burning aromatics
High temperature cogeneration with thermionic	[DE81-029480] p0093 N82-10155 Cyclone performance estimates for pressurized
burners	fluidized-bed combustion combined cycle
p0124 A82-11817	power generation
Thermionic combustor application to combined gas	[DE81-028504] p0093 N82-10156
and steam turbine power plants p0124 A82-11818	Study of the formation of submicron particulates
Plow aerodynamics modeling of an MBD swirl	generated by coal combustion [DE81-027447] p0008 N82-10586
combustor - Calculations and experimental	Survey of particulate emission macro- and
verification	micro-sampling and sizing methods
p0127 A82-12113	[DB81-028348] p0014 N82-11642
MHD coal combustor development [AIAA PAPER 82-0380] p0135 A82-17914	Solid and hazardous energy wastes: Synfuels. 1: Review of research activities
Studies of the regeneration of activated bauxite	[DE81-028503] p0014 N82-11644
used as granular sorbent for the control of	Control of utility boiler and gas turbine
alkali vapors from hot flue gas of coal combustion	pollutant emissions by combustion modification,
[DE81-030192] p0008 N82-10590	phase 2
High pressure MHD coal combustors investigation, phase 2	[PB81-222267] p0015 N82-11654 Power-plant fly-ash utilization: A
[DE81-027238] p0138 N82-10888	chemical-processing perspective
Fluidized bed coal combustion reactor	[DE81-025452] p0022 N82-13191
[NASA-CASE-NPO-14273-1] p0097 N82-11144	Chemical element concentrations in liquids and
Tennessee Valley Authority atmospheric fluidized-bed combustor simulation	solids associated with power plants using PGD systems
[DE81-030262] p0098 N82-11151	[DE81-030422] p0027 N82-14322
Vertical combustor for refuse combustion	Kinetics of reactions in a wet flue gas
[DB81-030002] p0098 N82-11152	simultaneous desulfurization and denitrification
One-dimensional equilibrium-chemistry flow model	system
for coal combustors [DE81-027622] p0099 N82-11158	[DE81-029853] p0033 N82-15607
Assessment of pulverized-coal-fired combustor	<pre>Fundamentals of nitric oxide formation in fossil-fuel combustion</pre>
performance	[DB81-030329] p0033 N82-15608
[DE81-030860] p0105 N82-12187	Assessment of the long-range transport of
Coal combustion in high convective flows	residential woodstove fine-particulate emissions
[DE81-030391] p0106 N82-12194 Low NO sub x heavy fuel combustor concept program	for two future United States energy scenarios [DE81-030096] p0033 N82-15613
[NASA-CR-165512] p0140 N82-12572	Effects of coal fly-ash disposal on water quality
Conversion of municipal solid waste to energy,	in and around the Indiana Dunes National
Jacksonville, Plorida, phase 1	Lakeshore, Indiana
[DE82-000808] p0019 N82-12613 Transient catalytic combustor model	[PB81-238479] p0034 M82-15624 COMMERCIAL REERGY
[NASA-CR-165324] p0142 N82-13507	The development and design of steam/water solar
Testing and evaluation of MHD materials and	receivers for commercial application
substructures	[ASHE PAPER 81-SOL-4] p0042 A82-10972
[DB81-024331] p0143 N82-13926	Conceptual design of an advanced water/steam
Update on Specified Buropean R and D Efforts. Part 1: Appendices .	receiver for a solar thermal central power system [ASHE PAPER 81-SOL-5] p0042 A82-10973
[DE81-026404] p0143 N82-13983	Energy transfer in wind-assist electric power
	systems
	p0130 A82-14359

Integration of decentralized generators with the Preliminary design study of underground pumped nydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, electric power grid p0006 N82-10334 [DE81-029731] appendix C. Major mechanical equipment [DE81-030672] p0158 Sampling design for the 1980 commercial and multifamily residential building survey [DE81-028783] p001 [DE81-030672] p0158 N82-11621 Compressed air energy storage: Preliminary design p0011 N82-11320 and site development program in an aquifer. Interrelationships of energy and the economy: A supplement to the National Energy Policy Plan required by Title VIII of the US Department of Volume 2: Utility system planning [DE82-000466] D0159 N82-13544 Energy Organization Act (Public Law 95-91) [DE81-027526] D0013 N Reservoir stability studies [DE81-030099] p0013 N82-11613 D0160 N82-15510 Compressed-air energy-storage technology: Program Department of Energy Solar Central Receiver Semiannual Meeting overview [SAND-80-8049] [DE81-030103] Ultimate in building energy analysis: DOE-2 and COMPRESSOR BLADES The effect of rotor blade thickness and surface BLAST finish on the performance of a small axial flow [DE81-028703] p0023 N82-13263 Coal-oil mixtures: An alternative fuel for the turbine commercial markets and large residential markets [NASA-TM-82726] p0114 N82-14379 [DE81-028335] COMPRESSORS Performance predictions of passive solar Incremental cooling load determination for passive commercial buildings [DE81-027979] direct gain heating systems [DE81-029882] p0079 N82-15247 D0081 N82-15575 Puels and electric energy consumed COMPUTATION [PB81-240442] Computational tools for pulverized-coal combustion p0032 N82-15594 p0098 N82-11148 COMMUNITIES [DE81-028582] Modeling energy-conservation potentials of community energy-system technologies Incremental cooling load determination for passive direct gain heating systems [DE81-029882] [DE81-026059] p0013 N82-11589 p0081 N82-15575 COMPARISON COMPUTATIONAL PLUID DYNAMICS Plow aerodynamics modeling of an MHD swirl Comparison of residential window distributions and effects of mass and insulation [DE81-027938] combustor - Calculations and experimental p0017 N82-12283 verification p0127 A82-12113 A numerical model for the flow within the tower of COMPONENT RELIABILITY Passive/hybrid solar components: An approach to standard thermal test methods a tornado-type wind energy system [PB81-227886] p0077 N82-13549 p0131 A82-14844 COMPOSITE MATERIALS Natural convection in air layers at various aspect Fundamental limits to the spectral selectivity of composite materials --- for absorbing solar ratios and angles of inclination p0058 A82-16249 radiation COMPUTER PROGRAMMING Two-phase flow in geothermal energy sources Method of determining the creep characteristics of [DE81-029037] p0103 N82-11404 composite materials COMPUTER PROGRAMS A practical method of analysis of the p0154 A82-11779 current-voltage characteristics of solar cells p0051 A82-12823 Development of battery separator composites [NASA-CR-165508] p0157 N82-11547 COMPOSITE STRUCTURES Wind energy conversion system design and analysis Optimum reinforcement shapes and paths for p0133 A82-17630 rotating composite shells p0154 A82-14513 Solar data base management system Bounds and exact theories for the transport [DE81-023122] p0066 N82-10952 properties of inhomogeneous media Computational tools for pulverized-coal combustion p0098 N82-11148 [DE81-028582] p0056 A82-15607 Lightning protection for composite rotor blades Computer models to support investigations of mputet mouers to support investigations surface subsidence and associated ground motion induced by underground coal gasification -- of windpowered turbines p0133 A82-17631 p0015 N82-11712 Composite flywheel balance experience [DE81-027131] [DE81-769341] Assessment of pulverized-coal-fired combustor p0157 N82-10549 COMPRESSED AIR performance p0105 N82-12187
Pyrolysis of coal-drived fuels using the laser-powered homographic Preliminary design study of underground pumped hydro and compressed-air energy storage in hard Volume 1: Executive summary laser-powered homogeneous pyrolysis technique rock. [DE81-029440] [DE82-000251] p0106 N82-12196 Ultimate in building energy analysis: DOE-2 and p0155 N82-10527 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard BLAST p0023 N82-13263 [DB81-028703] rock. Volume 2: Project design criteria: UPH [DE81-028107] p0156 N82-10528 Potential energy savings in the residential sector of the United States Preliminary design study of underground pumped hydro and compressed-air energy storage in hard [DE81-028873] p0028 N82-14662 Volume 5: Site selection Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] [DE81-028199] p0156 N82-10529 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard p0030 N82-15242 Incremental cooling load determination for passive direct gain heating systems
[DE81-029882] Volume 9: Design approaches, CAES. rock. Appendix D: Mechanical systems D0081 N82-15575 Methodology and basic algorithms of the Livermore [DE81-028200] p0156 N82-10530 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES Economic Modeling Systems [DE81-029430] p0035 N82-15833 Application of an LP model to strategic planning of multinational cooperative RD and D programs [DE81-028197] p0156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-029325] p0035 N82-16014 COMPUTER TECHNIQUES Control system development for a 1 MW/e/ solar [DE81-028110] p0157 N82-10574 thermal power plant Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH p0048 A82-11801 Computer flight planning for fuel efficiency p0006 A82-17289 [DE81-030673] p0158 N82-11620

COMPUTERIZED DESIGN SUBJECT INDEX

COMPUTERIZED DESIGN	Nonimaging concentrators for photovoltaic arrays
Focal plane flux distributions produced by solar concentrating reflectors	in space p0046 A82-11761
p0043 A82-11211 COMPUTERIZED SIMULATION	Secondary concentrators for parabolic dish solar thermal power systems
Alternative power sources for residential air-conditioning systems	p0048 A82-11798 The effect of concentrator field layout on the
p0039 A82-10331	EB-1 small community solar power system
Numerical simulation of sclar cell open circuit	p0048 A82-11799
voltage decay p0041 A82-10658	Theoretical analysis of the performance of a gravity-controlled solar concentrator
Modeling and testing a salt gradient solar pond in	p0050 A82-12812
northeast Ohio	Luminescent solar concentrators. II - Experimental
p0043 A82-11210 Solar panel current degradation factors	and theoretical analysis of their possible efficiencies
p0045 A82-11759	p0052 A82-13285
A modular simulation model for a wind turbine system [AIAA PAPEE 81-2558] p0128 A82-14017	Dish concentrators for solar thermal energy - Status and technology development
Industrial applications of MHD high temperature	[AIAA PAPER 81-2530] p0053 A82-14001
air heater technology	Development, solar test, and evaluation of a
[AIAA PAPER 81-2588] p0130 A82-14037 Incorporation and impact of a wind energy	high-temperature air receiver for point-focusing parabolic dish applications
conversion system in generation expansion planning	[AIAA PAPER 81-2532] p0053 A82-14003
p0004 A82-15068	Solar concentrator panel and gore testing in the
A solar heating system with annual storage p0056 A82-15666	JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005
Model calculations of the chemical processes	A seasonally adjusted concentrator with
occurring in the plume of a coal-fired power plant	modifications of absorber shape
p0005 A82-16342 Analytical evaluation of the aerodynamic	p0059 182-16598 Thermal deformation of concentrators in an
performance of a high-reliability vertical-axis	antisymmetric temperature field
wind turbine p0134 A82-17641	p0062 A82-18698
A computer model of a stirling engine using a	Integrated function nonimaging concentrating collector tubes for solar thermal energy
two-phase two-component working fluid	[DB81-029677] p0064 H82-10521
p0137 182-10492 Computational tools for pulverized-coal combustion	Apprication of solar thermal energy to buildings and industry
[DB81-028582] p0098_N82-11148	[SERI/TP-641-1222] p0066 N82-10563
One-dimensional equilibrium-chemistry flow model	Secondary and compound concentrators for parabolic
for coal ccmbustors [DE81-027622] p0099 N82-11158	dish solar thermal power systems [NASA-CR-164960] p0068 #82-11550
Solar heat pump simulator	Near-term improvements in parabolic troughs: An
[DE81-024368] p0070 N82-11583	economic and performance assessment [DE82-001158] p0073 N82-12615
Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588	Low-cost mirror concentrator based on inflated,
SPS large array simulation	double-walled, metallized, tubular films
p0071 N82-12540 Performance analysis and simulation of the SPS	[DE81-027813] p0081 N82-15551 CONCRETES
reference phase control system	Conceptual design of a glass-reinforced concrete
p0071 N82-12544 Application of different KPA-models in the	solar collector [DE81-029280] p0065 N82-10542
framework of the energy research programme of	Passive-solar-retrofit study for the United States
the European Communities	Na vy
[EUR-6758-EN] p0019 N82-12597 Ultimate in building energy analysis: DOE-2 and	[DB81-028921] p0074 N82-12629 Construction of a recycled Portland cement
BLAST	concrete pavement Connecticut expressway
[DE81-028703] p0023 N82-13263 Application of a gravity-driven wickless heat pipe	[PB81-233553] p0023 N82-13267 CONDENSATES
for ice production in a cold energy storage system	Environmental effects of pollutants from coal
p0159 N82-13377	combustion. 2: The Colstrip, Montana Power Plant
Silicon solar cell optimization [AD-A106005] p0076 N82-13514	[PB81-234114] p0026 N82-13573 CONDUCTIVE HEAT TRANSPER
Incremental cooling load determination for passive	Thermal analysis of three zone solar pond
direct gain heating systems [DB81-029882] p0081 N82-15575	p0054 A82-14406 Thermal performance of a solar still
[DB81-029882] p0081 N82-15575 Three-dimensional, finite elemental model for	p0058 A82-16229
simulating heavier-than-air gaseous releases	COMPRESECES
over variable terrain [DE81-028689] p0032 N82-15602	Heat Transfer - Milwaukee 1981; Proceedings of the Twentieth National Heat Transfer Conference,
CONCESTRATION	Milwaukee, WI, August 2-5, 1981
Response of the oceans to increasing atmospheric	p0145 A82-10806
carbon dioxide	Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14,
CONCENTRATORS	1981, Proceedings. Volumes 1, 2 & 3
AAI Corporation receiver design experience in concentrating solar collectors	p0121 A82-11701 Energy from biomass and wastes V; Proceedings of
[ASAE PAPER 81-SCL-1] p0041 A82-10969	the Fifth Symposium, Lake Buena Vista, PL,
Simple tracking strategies for solar concentrations p0042 A82-11207	January 26-30, 1981
Design and testing of a uniformly illuminating	p0090 182-12400 International Scientific Conference on Space,
nontracking concentrator	21st, Rome, Italy, March 25, 26, 1981, Proceedings
p0042 A82-11209 Focal plane flux distributions produced by solar	p0050 A82-12501 Bnergy future: Prophets, profits and policies:
concentrating reflectors	Proceedings of the Seventh Annual UMR-DWR
p0043 A82-11211 Geometrical optical performance studies of a	Conference on Energy, University of Bissouri-Rolla, Rolla, BO, October 14-16, 1980.
composite parabolic trough with a fin receiver	Volume 7
p0043 A82-11390	p0002 A82-12547

SUBJECT INDEX COOLING SYSTEMS

K/u/-band flat-profile Si-IMPATT diodes with 10-percent efficiency Energy technology VII: Expanding supplies and conservation: Proceedings of the Seventh Conference, Washington, DC, Barch 24-26, 1980 p0004 A82-14924 p0058 A82-16132 CONTAINMENT Energy technology VIII: New fuels era: Proceedings Flywheel rotor and containment technology of the Eighth Conference, Washington, DC, Barch development [DE81-028047] D0159 N82-14655 9-11, 1981 p0004 A82-14925
Retal hydrides 1980; Proceedings of the CONTABLBANTS Geothermal environmental assessment: Behavior of International Symposium on the Properties and selected geothermal brine contaminants in plants Applications of Metal Hydrides, Colorado Springs, CO, April 7-11, 1980. Volumes 1 & and soils [PB81-2223331 D0015 N82-11671 p0085 A82-16784 CONTINENTAL SHELVES
Plan for technological research and development Metallurgical coatings 1980; Proceedings of the related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 Appendixes: 1. Technical challenges. 2.
Research requirements. 3. High priority programs
[DE81-904014] p0104 N82-11520
Chemical and geochemical studies off the coast of American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings Washington p0132 A82-17626 [DE81-030319] p0017 N82-12513 International Microwave Symposium, Los Angeles, CA, June 15-19, 1981, Proceedings Environmental assessment of the Alaskan Continental Shelf: Annual reports of principal investigators for the year ending March 1980. Alternate fuels; Proceedings of the International Volume 5: Hazards [PB81-225732] Congress and Exposition, Detroit, MI, February 23-27, 1981 D0026 N82-13607 p0092 A82-18122 International Symposium on Wave and Tidal Energy, CONTINUOUS RADIATION Chronic exposure of a honey bee colony to 2.45 GHz 2nd, St. John's College, Cambridge, England, September 23-25, 1981, Proceedings continuous wave microwaves p0003 A82-14347 p0135 A82-18124 CONTRACTS Economic effects induced by ESA contracts, phase
2. Volume 1: Summary
[ESA-CR(P)-1462-VOL-1] p0161 N82-14 Macro-engineering: The rich potential; Proceedings of the Third Symposium, San Francisco, CA, January 6, 1980 p0161 N82-14981 p0006 A82-18643 CONTROL Status of the DOE battery and electrochemical Solar energy training program for code enforcement technology program 2 [DE81-029879] personnel p0156 N82-10540 ČDB81-0300531 p0081 N82-15563 Workshop proceedings: Combustion Turbine Residual CONTROL EQUIPMENT Control system development for a 1 MW/e/ solar 011 [EPRI-#S-80-132] thermal power plant p0103 N82-11261 Sixth Underground Coal-Conversion Symposium P0114 N82-14374 An evaluation of three-way control single and dual bed catalysts as applied to heavy-duty gasoline [DE81-027669] SOLTECH 80 [DE81-901931] p0079 N82-14643 engines Solar Photovoltaic Residential Project. Project [PB81-224982] p0012 N82-11477 Controlled Speed Accessory Drive demonstration Integration Beeting, Agenda and Abstracts [DE81-028433] p0079 N82-14657 program Project DEEP STEAM: Fourth meeting of the [NASA-CR-165010] D0026 N82-13981 technical advisory panel
[DE81-029457] p0144 N82-15561
Symposium proceedings: Environmental aspects of
fuel conversion technology, 5th CONVECTIVE PLON Natural convection in air layers at various aspect ratios and angles of inclination p0058 A82-16249 [PB81-245045] p0034 N82-15623 Test results and analysis of a convective loop Proceedings: Symposium on Flue Gas solar air collector Desulfurization, volume 1 [DB81-028151] p0070 N82-11599 CONVECTIVE HEAT TRANSFER
The effect of variable fluid properties on scale p0035 N82-15651 [PB81-243156] Proceedings: Symposium on Flue Gas modeling --- of solar central receivers Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 Technology of controlled nuclear fusion [DE81-027361] p0 CONVEYORS p0144 N82-15893 Safety and technical optimization of belt transfer CONGRESSIONAL REPORTS points with special consideration for the suppression of noxious and explosive dusts ---Natural gas plan needed to provide greater protection for high-priority and critical uses in coal plants p0023 N82-13255 [BMFT-FB-HA-80-048] p0096 N82-10279 [PB81-228488] Millions wasted trying to develor major energy Extensible bridge-conveyor concepts for coal-mine information system face baulage p0146 N82-12525 P0029 N82-14959 [AFMD-81-40] [DB81-031974] Coal and limestone feed testing for atmospheric CONSTRUCTION Summary of passive-solar-retrofit workshops [DB81-028146] p0065 ! fluidized bed combustion [DB81-030629] p0065 882-10547 D0117 N82-15222 Solar explosion COOLING [DB81-026086] p0074 N Study of multi-megawatt technology needs for p0074 N82-12628 The effect of inclination on the heat loss from flat-plate solar collectors photovoltaic space power systems. Volume 1: p0043 A82-11212 Performance testing of the TOLTEC TI-410 concentrating solar collector Executive summary [NASA-CR-165323-VOL-1] p0078 N82-14636 [DE81-029994] CONSTRUCTION MATERIALS D0071 N82-11617 Passive-solar-retrofit study for the United States Incremental cooling load determination for passive direct gain heating systems [DE81-029882] Navy [DE81-028921] n0081 N82-15575 p0074 N82-12629 CONTACT RESISTANCE COOLING SYSTEMS Laser bonded n-Gals/p-GaSb heterojunction Aquifer thermal energy storage - A feasibility intercell Ohmic contact study for large scale demonstration p0154 A82-11846 p0041 A82-10776 Energy analysis sample building data

[DE81-027188]

p0011 N82-11318

COORDINATION POLYMERS SUBJECT INDEX

Investigation of direct expansion in ground so	
heat pumps [DE81-024139] p0012 N82-	heat-pump systems -11418 [DE81-030309] p0067 N82-11407
Well-water-source heat pump field performance:	study Second generation heliostat, volume 1
[DE81-024136] p0012 N82-	·11419 [DE81-029618] p0069 N82-11564
Comparison of concepts for solar-heated or solar-driven absorption and compression cool:	National coal-market conditions for the year 2000: Ing Regional-issue identification and analysis, high
machines for air conditioning and food	scenario
preservation purposes, phase 1	[DB81-026425] p0016 N82-11988
[BMFT-FB-T-81-165] p0080 N82- COORDINATION POLYMERS	15541 Extensible bridge-conveyor concepts for coal-mine face haulage
Improved polymers for enhanced oil recovery	[DE81~031974] p0146 N82~12525
synthesis and rheology	Potential energy savings in the residential sector of the United States
[DE81-030194] p0118 N82-	[DE81-028873] p0028 N82-14662
Spectrally selective copper sulphide coatings	COST RPFECTIVENESS
p0040 A82- Infrared quenching of photocapacitance in	10468 The economic implications of the exergy and thermal efficiencies of energy conversion systems
Cu/x/S/CdS solar cells	p0121 A82-11702
p0042 A82-	
Effect of annealing CdS on a sintered CdS/Cu2S solar cell	p0089 A82-11836 Transportation systems and cost comparison for
p0051 A82-	12820 launching an SPS into geosynch. orbit
CORN	p0050 A82-12507
Solar-supplemented, natural air drying of shell corn: The economic limitations	ed OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and
[PB81-235681] p0079 N82-	14668 operational description with user documentation
CORRELATION	[DE81-029701] p0007 N82-10514
Development of organic geochemical and isotope techniques for hydrocarbon exploration	Bectenna session: Micro aspects p0149 N82-12562
[BMFT-FB-T-80-076] p0097 N82-	
Development of a thermodynamic properties correlation framework for the coal conversion	power stations [NASA-TP-1955] p0150 N82-14202
industry, phase 1A	COST ESTINATES
[DE81-030363] p0111 N82-	
CORROSION Aging and corrosion problems with flat solar	photovoltaic blankets
energy absorbers. Study based upon literature	Small-scale uses and costs of hydrogen derived
and experiment exchanges [SP-RAPP-1979/4] p0077 N82-	from OTEC annonia 13548 p0084 A82-11792
[SP-RAPP-1979/4] p0077 N82- Update on Specified European R and D Efforts.	Cost estimates for advanced/innovative wind energy
Part 1: Appendices	conversion systems /AWECS/
[DE81-026404] p0143 N82- CORROSION PREVENTION	13983 [AIAA PAPER 81-2557] p0128 A82-14016 An estimate of OTEC costs, market potential and
A protective additive for jet fuels	proof-of-concept vessel financing
p0090 A82-	
CORROSION RESISTANCE Corrosion science and its application to solar	Magnetohydrodynamics MHD Engineering Test Facility ETF 200 MWe power plant. Conceptual Design
thermal energy material problems	Engineering Report CDER. Volume 3: Costs and
p0038 A82- Photocorrosion of strontium titanate photoanode	
p0057 A82-	16056 Study of photovoltaic cost elements. Volume 1:
Materials technology for coal-conversion proces	ses Executive report. Volume 2: Project background
[DE81-028474] p0100 #82- Selection and testing of suitable coating syste	
for steel ripes used for long distance heat	Sandia National Laboratories photovoltaic
transfer [BMFT-FB-T-81-138] p0150 N82-	systems design catalog 15134 [DB81-030986] p0069 N82-11567
CORROSION TESTS	Study of photovoltaic cost elements. Volume 4:
The corrosion of some superalloys in contact wi	th Installation cost model for residential PV
coal chars in coal gasifier atmospheres	systems: Users manual 17974 [DE81-031921] p0069 N82-11568
Corrosion testing of carbon steel in aereated	Study of photovoltaic cost elements. Volume 5:
geothermal brine [DE81-028653] p0093 N82-	Installation cost model for intermediate PV 10201 systems: Users manual
[DE81-028653] p0093 N82- COST ANALYSIS	[DE81-030981] p0069 N82-11569
Antenna optimization and cost consideration for	
the Solar Power Satellite microwave system p0145 A82-	Northwest: Impacts associated with residential use of solid fuels
Advanced Satellite Power System /SPS/ concept	[DB81-029137] p0115 N82-14383
p0049 A82-	
Analysis of electric utility investments into we power	ind Introduction to solar materials science p0037 A82-10008
[AIAA PAPER 81-2537] p0003 A82-	14006 Secondary concentrators for parabolic dish solar
Solar thermal cost goals - Implementing a methodology for assessing break-even value ar	thermal power systems d p0048 A82-11798
market potential	The effect of concentrator field layout on the
[AIAA PAPER 81-2550] p0054, A82-	
Wind turbine assisted diesel generator systems [AIAA PAPER 81-2559] p0128 A82-	p0048 A82-11799 14018 Investigation of the possibility of using
Composite flywheel balance experience	inexpensive concentrating systems in the modules
[DE81-769341] p0157 N82-	
Annual cycle energy system [DE81-024911] p0007 M82-	p0052 A82-13713 10552 Air circuit with heating pump
Status of nickel/zinc and nickel/iron battery	[BMFT-FB-T-80-188] p0017 H82-12404
technology for electric vehicle applications [DE81-023572] p0157 #82-	COSTS 10962 Low-cost mirror concentrator based on inflated,
[220, 223,2] 9013, 202-	double-walled, metallized, tubular films
	[DB81-027813] p0081 M82-15551

COUNTER-ROTATING WHERLS Flywheel rotor and containment tech	nology	CHYOGENIC ROCKET PROPELLANTS Technological innovation for succes	s - Lianid
development		hydrogen propulsion	_
[DE81-028047] COUNTERPLON	p0159 N82-14655	CRYSTAL DEFECTS	p0084 A82-1673
<pre>High-temperature counter-flow recur [DE81-031923]</pre>	erator p0017 N82-12424	Introduction to the role of crystal solar materials	defects in
CRACK PROPAGATION .	-		p0037 A82-10009
Fracture mechanics of cellular glas [NASA-CR-164959]	p0066 N82-11209	Effects of low temperature periodic the deep-level defects in 200 keV	
Workshop proceedings: U-bend tube		irradiated AlGaAs-GaAs solar cell	s
steam generators [DE81-903765]	p0142 N82-13515	Impurity effects in a-Si:H solar ce	p0061 A82-1828 lls
CRACKING (PRACTURING)	-	[DE81-025069]	p0069 N82-1157
Performance of terrestrial photovol MIT Lincoln Laboratory experiment		CRYSTAL DISLOCATIONS Photovoltaic mechanisms in polycrys	talline thin
systems [DE81-029995]	p0064 N82-10519	film silicon solar cells [DE81-030370]	-0072 NOT 1260
CREEP PROPERTIES	_	CRYSTAL GROWTH	p0072 N82-1260
Method of determining the creep cha composite materials	racteristics of	Zn3P2 as an improved semiconductor pnotovoltaic solar cells	for
_	p0154 A82-11779	[DE81-025587]	p0069 N82-1157
CREEP TESTS Method of determining the creep cha	racteristics of	CRYSTAL STRUCTURE Introduction to the role of crystal	defects in
composite materials	p0154 A82-11779	solar materials	p0037 A82-1000
CRITERIA	-	CRYSTALLIZATION	•
Preliminary design study of undergr hydro and compressed-air energy s		Silicon solar cell process developm fabrication and analysis	ent,
rock. Volume 3: Project design	criteria: CABS	[NASA-CR-163787]	p0063 N82-1050
[DE81-028197] CROSS PLOW	p0156 N82-10546	Crystallized fly-ash feasibility st [EPRI-EL-1836]	udy p0009 N82-1059
An analytic model of high sclidity windmills	vertical axis	Aluminum recovery from fly ash and wastes	
	p0131 A82-14360	[DE81-027675]	p0099 N82-1115
CROSSED FIELD AMPLIFIERS The adapting of the crossed-field d	lirectional	CURRENT DENSITY Evaluation of organic acids as fuel	cell
amplifier to the requirements of	the SPS p0148 N82-12554	electrolytes	p0127 A82-1293
CRUDE OIL	•	Effect of junction depth on the per	formance of a
Production of synthetic crude oil f the TOSCOAL pyrolysis process	rcm coal using	diffused n/+/p silicon solar cell	p0056 A82-1544
	p0090 A82-11849	Loading schemes for a 50 MW/th/ dia	
Comparison of Michigan Basin crude	p0091 A82-17007	connected MHD generator [AIAA PAPER 82-0395]	p0135 A82-1792
Development of newer methods for the identification of certain components		CURRENT DISTRIBUTION Impact of uniform electrode current	distribution
complex mixtures derived from ene	ergy sources and	on ETF Engineering Test Facıl	ity MHD generator
the determination of their biolog via bioassay systems	lical activity	[AIAA PAPER 82-0423] CURREST REGULATORS	p0135 A82-1794
[DE81-028311] Venezuela, Trinidad and Totago: Cr	p0092 N82-10148	Loading schemes for a 50 MW/th/ dia- connected MHD generator	gonally
potential from known deposits		[AIAA PAPER 82-0395]	p0135 A82-1792
[DE81-027023] Petroleum geology and resource asse	p0096 N82-10474	Distributed photovoltaic systems: interface issues and their presen	
middle Caspian Basin, USSR, with		[NASA-CR-165019]	p0076 N82-1349
emphasis on the Uzen field [DE81-029951]	p0104 N82-11518	CYLINDRICAL BODIES Experimental investigation of parab	olic-cvlinder
US energy strategies: Some options	for	solar concentration with tubular	heat receiver
eliminating oil imports by the ye [PB81-226052]	p0014 N82-11626	CYLINDRICAL TANKS	p0040 A82-1038
Development of superior denitrogena isomerization catalysts for proce		Performance of a cylindrical phase energy storage unit	change thermal
derived from shale, part 1	_	[AIAA PAPER 82-0076]	p0155 A82-1777
[AD-A105667] Oil spill identification by chemica	p0113 N82-14317 al analysis	D	
International energy indicators	p0115 N82-14583	DAMS	
[DE81-028117]	p0028 N82-14653	Modular hydro dam approach to the e	
CRUISING PLIGHT Bnergy savings with today's technol	VDO.	development of ultra low-head hyd: [DE81-027817]	ropower p0019 N82-1263!
aircraft fuel management through	in-flight	DATA ACQUISITION	•
monitoring	p0005 A82-17282	Solar project description for Colors Single family	
CRUSTAL PRACTURES Practure flow of groundwater in coa	l-hearing strate	[DE81-028054] Meteorological and climatological in	p0064 N82-10510
[DE81-023810]	p0096 N82-10479	Review of January - June 1980 inve	estigative period
CRYOGENIC COOLING Cryogenic testing of 100-m supercon	ducting power	[DE81-030740] DATA BASE MANAGEMENT SYSTEMS	p0111 N82-1273
transmission test facility [DE81-028331]	p0150 N82-13517	PGDIS primer: Major equipment/comp classifications, problem/solution	
Cool-down flow-rate limits imposed		and definitions related to FGD sy	stems as
stresses in LNG pipelines [DE81-028731]	p0150 N82-14484	contained in the Flue Gas Desulfu Information System (PGDIS)	rization
CRYOGENIC PLUID STORAGE The storage of hydrogen		[PB81-225948]	p0016 N82-11985
massage on wingades	p0085 A82-17130	Solar Energy Information Data Bank program, FY 1981	
		[DE81-030054]	p0073 N82-12612

Relational methodology for integrating and analyzing field test and research data	Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2.
describing enhanced cil recovery	Volume 3: Customer load management systems
[DE81-030441] p0118 N82-15508 DATA BASES	[DE82-900208] p0071 M82-12280 Regional load-curve models: Scenario and forecast
Solar data base management system	using the DRI model
[DB81-023122] p0066 N82-10952	[DE81-904192] p0033 N82-15605
Atmospheric fluidized-bed projects technology overview	DEWITEOGREATION Development of superior denitrogenation and
[DB81-027143] p0102 B82-11251	isomerization catalysts for processing crude oil
GRAD: A tool for program analysis and progress monitoring	derived from smale, part 1 [AD-A105667] p0113 N82-14317
[DE81-028098] p0120 N82-15981	DEBSITY MEASUREMENT
DATA PROCESSING	Density-measurement studies at the BI-GAS pilot
Solar data base management system [DE81-023122] p0066 N82-10952	plant [DE82-000910] p0108 N82-12262
Hillions wasted trying to develor major energy	DEPOSITION
information system [APMD-81-40] p0029 N82-14959	Colloidally deposited high-temperature solar selective surfaces
DATA SYSTEMS	p0055 A82-15439
Energy end-use requirements in manufacturing,	Stratigraphy and depositional history of the Iola
Volume 3 [DE81-027976] p0007 N82-10544	Limestone Upper Pennsylvanian (Hissourian), Northern Hidcontinent U.S.
DC 9 AIRCRAFT	p0116 N82-14711
Fuel conservation - DC-9 series 20/30/40 p0002 A82-12563	DBPOSITS Venezuela, Trinidad and Tobago: Crude oil
DECISION MAKING	potential from known deposits
Case studies in the application of air quality	[DE81-027023] p0096 N82-10474
modelling in environmental decision making: Summary and recommendations	DEPTH MEASUREMENT Schlumberger resistivity study of the Jemez
[PB81-213233] p0009 N82-10605	Springs region of northwestern New Mexico
User needs for solar decision-making tools: The homebuilding industry	[DE81-025302] p0119 N82-15661 DESIGN ANALYSIS
[DB81-027293] p0067 N82-11325	Conceptual design of an advanced water/steam
Building a consensus about energy technologies	receiver for a solar thermal central power system
[DE82-000501] p0024 B82-13536 The nuclear controversy: Unequal competition in	[ASME PAPER 81-SOL-5] p0042 A82-10973 Design considerations for a 1500 M head 300-600 MW
public policy-making	double stage reversible pump/turbine with
[ERG-035] p0027 N82-14626 Need for power and the choice of technologies:	regulation p0154 A82-11782
State decisions on electric power facilities	Design considerations for small wind energy
[DE81-025960] p0027 N82-14644	conversion and storage systems
Role of large scale energy systems models in R&D planning	p0126 A82-11831 Status report on MHD generator materials
[DE81-026058] p0031 N82-15543	pC126 A82-11854
Evaluating R and D options under uncertainty. Volume 3: `An electric-utility	A seasonally adjusted concentrator with modifications of absorber shape
generation-expansion planning model	p0059 A82-16598
[DB81-904237] p0035 N82-16013 DECOMPOSITION	Theoretical analysis of the Presnel lens as a
Pyrolysis of coal-drived fuels using the	function of design parameters for solar concentrators
laser-powered homogeneous pyrolysis technique	p0059 A82-16599
[DE82-000251] p0106 N82-12196 Investigation of factors affecting the in-situ	Aplanatic double reflection system for thermophotovoltaic applications - Design
combustion retorting of cil shale	p0060 A82-17293
[DE82-000482] p0106 N82-12200 DEEP SPACE NETWORK	End region and current consolidation effects upon the performance of an MHD channel for the ETF
An optimization model for energy generation and	conceptual design Engineering Test Facility
distribution in a dynamic facility	[AIAA PAPER 82-0325] p0135 A82-17889
p0011 N82-11310	Design of a cell for electrode kinetic investigations of fuel cell reactions
Development of a small-scale commercial alcohol	p0136 A82-18394
deaydration 190 to 200 proof [DE81-030158] p0100 N82-11235	Preliminary design study of underground pumped hydro and compressed-air energy storage in hard
DEMAND (ECONOMICS)	rock. Volume 9: Design approaches, CAES.
Relaxing environmental standards during oil-supply	Appendix D: Mechanical systems
disruptions: Past, present and future [DB81-024250] p0009 N82-10601	[DE81-028200] p0156 N82-10530 Composite flywheel balance experience
Electric power supply and demand for the	[DE81-769341] p0157 N82-10549
contiguous United States, 1981 - 1990 [DE81-027126] p0012 N82-11376	Novel design of pressure vessels and thermal shields in coal gasifiers
National coal-market conditions for the year 2000:	[DE81-025828] p0104 N82-11474
Regional-issue identification and analysis, high	Second generation heliostat, volume 1
scenario [DE81-026425] p0016 N82-11988	[DE81-029618] p0069 #82-11564 Designing process wells for an underground
Assessment of potential future markets for the	coal-gasification environment
production of hydrogen from water [BMFT-FB-T-81-012] p0086 N82-12266	[DE81-028434] p0108 N82-12264 Extensible bridge-conveyor concepts for coal-mine
Solar Heating And Cooling Of Buildings (SHACOB):	face haulage
Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for	[DE81-031974] p0146 N82-12525 Conceptual design of superconducting magnet system
residential structures	for Magnetohydrodynamic (MHD) Engineering Test
[DE82-900206] p0017 N82-12278	Facility (ETF) 200 MWe power plant
Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2.	[NASA-CR-165053] p0143 N82-14520 Design of an energy conservation building
Volume 2: Domestic hot water systems	[NASA-TH-83175] p0027 N82-14632
[DB82-900207] p0071 N82-12279	Performance predictions of passive solar commercial buildings
	[DE81-027979] p0079 NB2-15247

SUBJECT INDEX DIRECTIVITY

Evaluating R and D options under uncertainty.	Energy and development in Central America. Volume
Volume 2: Atmospheric fluidized-bed combustion	2: Country assessments
connercialization strategies	[PB81-231557] p0032 N82-15590
[DE81-904246] p0035 N82-16012	DIAPHRAGHS (MECHANICS)
DESCLEGEZING	Riectrodes and diaphragms for fuel cells
Desulfurization with transition metal catalysts	[BMFT-PB-T-81-047] p0 143 M82-14666 DIESEL ENGINES
[DE81-028935] p0092 H82-10143 Coal desulfurization by low temperature	Wind turbine assisted diesel generator systems
chlorinolysis, phase 3	[AIAA PAPER 81-2559] p0128 A82-14018
[NASA-CR-164957] p0098 N82-11145	Ceramics for the AGT101 automotive gas turbine
Laboratory study for removal of organic sulfur	p0132 A82-16827
from coal	Alternate fuels; Proceedings of the International
[DE81-025132] p0010 N82-11239	Congress and Exposition, Detroit, MI, February
Sulfur pollution control. Phase 1: The disposal	23-27, 1981
program	p0092 A82-18122
[PB81-222612] p0014 N82-11652	Informational report on the measurement and
RPA utility FGD (Flue Gas Desulfurization) survey	characterization of diesel exhaust emissions [PB81-221251] p0009 N82-11175
[PB81-225773] p0015 N82-11679 FGDIS primer: Major equipment/component	[PB81-221251] p0009 N82-11175 Alternate hybrid power sources for remote site
classifications, problem/solution access codes,	applications
and definitions related to FGD systems as	[AD-A099471] p0024 N82-13512
contained in the Flue Gas Desulfurization	Survey of proposed methods of burning alcohol in
Information System (FGDIS)	diesel engines
[PB81-225948] p0016 N82-11985	[DE81-025834] p0030 N82-15219
Oxydesulfurization of coal by acidic iron sulfate	The utilisation of alcohol in light duty diesel
solutions	engines
[DB82-000464] p0106 882-12199	[PB81-244469] p0118 N82-15452
Development of a process for recovery of valuable	DIESEL FUELS
components from complex hydrodesulfurization	Alternate fuels; Proceedings of the International
catalysts especially tungsten, molybdenum,	Congress and Exposition, Detroit, MI, February 23-27, 1981
vanadium, nickel and cobalt [BMFT-FB-T-80-186] p0016 N82-12204	p0092 A82-18122
Hydrodesulfurization of chlorinated coal	Selectivity in Fischer-Tropsch synthesis: Review
[NASA-CASE-NPO-15304-1] P0107 N82-12240	and recommendations for further work
Preliminary study: Use of low-sulfur coal and	[PB81-223596] p0095 N82-10271
coal cleaning in control of acid rain	Outgassing of two synthetic fuels
[DB81-028930] p0021 N82-12675	[AD-A104580] p0100 N82-11231
Chemical element concentrations in liquids and	Transportation fuels from synthetic gas
solids associated with power plants using PGD	[DE81-029614] p0102 N82-11258
Systems	Development of catalytic systems for the
[DB81-030422] p0027 N82-14322	conversion of syngas to jet fuel and diesel fuel and higher alcohols
Process for removing sulfur oxides from gases with direct production of a usable finished reaction	[DE82-000067] p0108 N82-12255
product ammonium sulfate fertilizer	Survey of proposed methods of burning alcohol in
[BMFT-FB-T-81-102] p0029 N82-15142	diesel engines
Coal resources and sulphur emission regulations:	[DE81-025834] p0030 N82-15219
A summary of 8 eastern and midwestern states	Characterization of diesel emissions as a function
[PB81-240319] p0031 N82-15514	of fuel variables
Kinetics of reactions in a wet flue gas	[PB81-244048] p0118 N82-15233
simultaneous desulfurization and denitrification	DIBTS
System	Energy expenditure and dietary change
[DE81-029853] p0033 N82-15607	[PB81-218471] p0009 N82-10717 DIPPUSERS
Blemental composition of atmospheric fine-particles emutted from coal burned in a	Computational analysis of diffuser-augmented wind
modern electric power plant equipped with a	turbines
flue-gas desulfurization system	p0132 A82-16743
[DE81-030073] p0033 N82-15610	DIPPUSION CORPFICIENT
Use of coal cleaning for compliance with SO2	Some characteristics of silicon photocells
emission regulations	fabricated by planar technology
[PB81-247520] p0034 N82-15618	p0039 A82-10386
Demonstration of Wellman-Lord/Allied Chemical PGD	DIGITAL SIMULATION
technology: Demontration test second year results [PB81-246316] p0034 N82-15626	Numerical simulation of solar cell open circuit
[PB81-246316] p0034 N82-15626 Proceedings: Symposium on Flue Gas	voltage decay p0041 A82-10658
Desulfurization, volume 1	DIGITAL SYSTEMS
[PB81-243156] p0035 N82-15651	The role of avionics in the all electric airplane
Proceedings: Symposium on Flue Gas	[AIAA 81-2219] p0002 A82-13457
Desulfurization, volume 2	DIMENSICHAL ABALYSIS
[PB81-243164] p0035 N82-15652	The universal plane method for calculating the
DETONATION	dimensions of heliostats
Optimization of the composition and antidetonation	p0062 A82-18697
properties of AT-93 gascline	DIODES
P0091 A82-15722 DEVELOPING WATIONS	The history of the development of the restance
	The history of the development of the rectenna
Application of solar power satellites to India's	p0149 N82-12560
Application of solar power satellites to India's energy needs - A macroengineering solution to a	
	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmium telluride thin films for solar-cell applications
energy needs - A macroengineering solution to a macroproblem p0062 A82-18645	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmum telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569
energy needs - A macroengineering solution to a macroproblem p0062 A82-18645 Urban ecosystem and resource-conserving urbanism	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 Design considerations for vehicular fuel cell
energy needs - A macroengineering solution to a macroproblem p0062 A82-18645 Urban ecosystem and resource-conserving urbanism in Third World cities	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmum telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 Design considerations for vehicular fuel cell power plants
energy needs - A macroengineering solution to a macroproblem p0062 A82-18645 Urban ecosystem and resource-conserving urbanism in Third World cities [DE81-029854] p0016 N82-11995	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 Design considerations for vehicular fuel cell power plants [DE81-769737] p0138 N82-10961
energy needs - A macroengineering solution to a macroproblem p0062 A82-18645 Urban ecosystem and resource-conserving urbanism in Third World cities [DE81-029854] p0016 N82-11995 Modelling energy-economic interactions in	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmum telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 Design considerations for vehicular fuel cell power plants [DE81-769737] p0138 N82-10961 Develop and test fuel cell powered on-site
energy needs - A macroengineering solution to a macroproblem p0062 A82-18645 Urban ecosystem and resource-conserving urbanism in Third World cities [DE81-029854] p0016 N82-11995 Modelling energy-economic interactions in developing countries: A linear-programming	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 Design considerations for vehicular fuel cell power plants [DE81-769737] p0138 N82-10961 Develop and test fuel cell powered on-site integrated total energy system. Phase 3:
energy needs - A macroengineering solution to a macroproblem p0062 A82-18645 Urban ecosystem and resource-conserving urbanism in Third World cities [DE81-029854] p0016 N82-11995 Modelling energy-economic interactions in developing countries: A linear-programming approach	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 Design considerations for vehicular fuel cell power plants [DE81-769737] p0138 N82-10961 Develop and test fuel cell powered on-site integrated total energy system. Phase 3: Full-scale power plant development
energy needs - A macroengineering solution to a macroproblem p0062 A82-18645 Urban ecosystem and resource-conserving urbanism in Third World cities [DE81-029854] p0016 N82-11995 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 Design considerations for vehicular fuel cell power plants [DE81-769737] p0138 N82-10961 Develop and test fuel cell powered on-site integrated total energy system. Phase 3: Full-scale power plant development [NASA-CR-165328] p0142 N82-13490
energy needs - A macroengineering solution to a macroproblem p0062 A82-18645 Urban ecosystem and resource-conserving urbanism in Third World cities [DE81-029854] p0016 N82-11995 Modelling energy-economic interactions in developing countries: A linear-programming approach	p0149 N82-12560 DIRECT POWER GENERATORS Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 Design considerations for vehicular fuel cell power plants [DE81-769737] p0138 N82-10961 Develop and test fuel cell powered on-site integrated total energy system. Phase 3: Full-scale power plant development

SPS phase control studies		DUST COLLECTORS
	p0147 N82-12549	Safety and technical optimization of belt transfer
DISPERSING		points with special consideration for the
Three-dimensional, finite elementa:		suppression of noxious and explosive dusts
simulating heavier-than-air gase	ous releases	in coal plants
over variable terrain		[BMFT-FB-HA-80-048] p0096 N82-10279
[DB81-028689]	p0032 N82-15602	DUST STORMS
DISTILLATION		Investigation of abrasive action of atmospheric
Development of a small-scale commen	rcial alcohol	particles on the reflectance of mirrors
dehydration 190 to 200 proof		p0040 A82-10388
[DE81-030158]	p0100 N82-11235	SOLTECH 80
Energy conservation in distillation		[DE81-901931] p0079 N82-14643
[DE81-028650]	p0018 N82-12581	DIE LASERS
DISTILLATION EQUIPMENT		Luminescent solar concentrators. II - Experimental
Thermal performance of a solar still		and theoretical analysis of their possible
	p0058 A82-16229	efficiencies
Alcohol fuels grant program at Line		p0052 A82-13285
Community College, Springfield,		DYBAMIC CHARACTERISTICS
[DB82-000744]	p0114 N82-14375	Experimental evaluation of the steady-state and
DIURNAL VARIATIONS		dynamic performance characteristics of the
Evaluation of All-Lay-Efficiency for		interactive units of a coal-gasification process
plate and evacuated tube collecte		[DB81-028995] p0094 N82-10259
[NASA-CR-161866]	p0063 N82-10504	DINAMIC CONTROL
DOCUMENTS		Controlled velocity testing of small wind energy
Indian energy abstracts		conversion systems - An evaluation of a technique
[PB81-232316]	p0032 N82-15591	p0134 A82-17642
DOMESTIC ENERGY		DYNAMIC PROGRAMMING
Energy potential and early operation	onal experience	Evaluating R and D options under uncertainty.
for large wind turbines		Volume 3: An electric-utility
	p0132 A82-17627	generation-expansion planning model
Wind driven fluid devices for water		[DE81-904237] p0035 N82-16013
	p0134 A82-17639	DYNAMIC RESPONSE
Application of solar power satellis		Dynamic performance analysis for the solar hybrid
energy needs - A macrcengineering	g solution to a	repowering of the El Paso Electric Company
macroproblem	0000 100 4000	Newman Unit No. 1
	P0062 A82-18645	p0048 A82-11802
US energy strategies: Scme options		DYNAMIC STABILITY
eliminating oil imports by the ye		The stability of a tethered gyromill
[PB81-226052]	p0014 N82-11626	[AIAA PAPER 81-2569] p0129 A82-14026
National interim energy-consumption		Yaw dynamics of a horizontal axis wind turbine
Exploring the Variability in ener		p0133 A82-17637
[DE81-029910]	p0018 N82-12589	Dynamic stability of stacked disk type flywheels
Annual report to the President and		[DE81-030008] p0156 N82-10535
the State Energy Conservation Pro	cdram for	DYNAMIC STRUCTURAL ANALYSIS
	•	
calendar year 1980		Enertech High Reliability prototype vi'ration
calendar year 1980 [DE81-025862]	p0031 N82-15554	analysis
calendar year 1980 [DE81-025862] DOPED CRYSTALS	p0031 N82-15554	
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electron	p0031 N82-15554	analysis p0133 A82-17635
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells	p0031 N82-15554 ode for solar	analysis
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359]	p0031 N82-15554	p0133 A82-17635
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG	p0031 N82-15554 ode for solar p0063 N82-10507	analysis p0133 A82-17635
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for o	p0031 N82-15554 ode for solar p0063 N82-10507 determining the	analysis p0133 A82-17635 EARTH AXIS Dimensions, volume 65, number 3
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of b	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind	analysis p0133 A82-17635 E EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] p0161 N82-15436
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obasic aerodynamic properties of turbine airfoils with test results	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind	analysis p0133 A82-17635 E EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST p0161 N82-15436
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of b	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA	analysis p0133 A82-17635 E BARTH AXIS Dimensions, volume 65, number 3 [FB81-235053]
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of turbine airfoils with test results 0015 and a modified section	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind	analysis p0133 A82-17635 E EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053]
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005	analysis p0133 A82-17635 EARTH AXIS Dimensions, volume 65, number 3 [PB81-235053] p0161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005	analysis p0133 A82-17635 E EARTH AXIS Dimensions, volume 65, number 3 [PB81-235053] p0161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obasic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396]	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005	analysis p0133 A82-17635 E EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053]
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS)	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614	analysis E EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obasic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396]	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614	analysis p0133 A82-17635 E EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053]
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel dispersions.	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614	analysis p0133 A82-17635 E EARTH AXIS Dimensions, volume 65, number 3 [PB81-235053] p0161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for basic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel diagrams of the control of the con	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150	EARTH AXIS Dimensions, volume 65, number 3 [PB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] p0015 N82-11712
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obasic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel degrees of the properties of the propertie	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150	EBARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 BARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel dis [DE81-028391] DRY HRAT Hot dry rock geothermal energy developments	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series Vs. shunt regulators for power control in
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel displayed the content of the con	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560	ERRTH AXIS Dimensions, volume 65, number 3 [PB81-235053] PO161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces PO089 A82-10372 BARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obasic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LiQUIDS) Soot formation in synthetic fuel difference of the differ	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obasic aerodynamic properties of lurbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel dr [DE81-028391] DRY HRAT Hot dry rock geothermal energy development of the dry rock geothermal energy development of the constitutions of the constitutions of the constitutions [PB81-235681]	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560	ERRTH AXIS Dimensions, volume 65, number 3 [PB81-235053] PO161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces PO089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems PO045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] PO150 N82-14202
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of liturbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel displayed for the displayed formation of the displ	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled	ERRTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsice aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel de [DE81-028391] DRY HEAT Hot dry rock geothermal energy dever [LA-UR-81-1265] DRYING Solar-supplemented, natural air dry corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces P0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOUBCES Hot dry rock geothermal energy development program
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for a basic aerodynamic properties of a turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel drag (DE81-028391) DRY HRAT Hot dry rock geothermal energy deventable of the dry rock geothermal energy deventables of the control of	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] PO 161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] p0097 N82-10560
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of iturbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel difference of the diffe	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building	EARTH AXIS Dimensions, volume 65, number 3 [PB81-235053] Po161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces Po089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] PO015 N82-11712 EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] PO150 N82-14202 EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Vater-related constraints to the development of
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel drag [DE81-028391] DRY HEAT Hot dry rock geothermal energy dever [LA-UR-81-1265] DRYING Solar-supplemented, natural air dry corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073]	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668	ERRTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces P0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Water-related constraints to the development of geothermal electric generating stations
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for chasic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel dr [DE81-028391] DRY HRAT Hot dry rock geothermal energy dever [LA-UR-81-1265] DRYING Solar-supplemented, natural air dr corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces P0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Water-related constraints to the development of geothermal electric generating stations [DE81-025138] P0007 N82-10561
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for basic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel dr [DE81-028391] DRY HRAT Hot dry rock geothermal energy deventable of the constant of the consta	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265 ttry for	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] PO161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UB-81-1265] Water-related constraints to the development of geothermal electric generating stations [DE81-025138] Baritime support for ocean-resources development
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for chasic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel dr [DE81-028391] DRY HRAT Hot dry rock geothermal energy dever [LA-UR-81-1265] DRYING Solar-supplemented, natural air dr corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265 try for	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Water-related constraints to the development of geothermal electric generating stations [DE81-025138] Haritime support for ocean-resources development [AD-A104730]
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel diagnostic formation in synthetic fuel diagnostic formation in synthetic fuel diagnostic formation formation in synthetic fuel diagnostic formation formation fuel find the formation formation formation formations [LA-UR-81-1265] DRYING Solar-supplemented, natural air dry corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating fump [BMFT-FB-T-80-186] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW Optimization of flow passage geometric formation, plate-type solar conditions	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265 ttry for	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces P0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Vater-related constraints to the development of geothermal electric generating stations [DE81-025138] Haritime support for ocean-resources development [AD-A104730] Creating a safer environment in US coal mines:
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for chasic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel drag (DE81-028391) DRY HRAT Hot dry rock geothermal energy dever [LA-UR-81-1265] DRYING Solar-supplemented, natural air dry corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW Optimization of flow passage geometric air-heating, plate-type solar conducts	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265 try for llectors p0055 A82-14846	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOUBCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Water-related constraints to the development of geothermal electric generating stations [DE81-025138] p0007 N82-10561 Haritime support for ocean-resources development [AD-A104730] Creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program,
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel diagnosis of the description of the diagnosis of the description of the concentrations [PE81-028391] DRY HRAT Hot dry rock geothermal energy development of the description of the concentrations [PE81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW Optimization of flow passage geometric diagnosis of the description of the of	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265 try for llectors p0055 A82-14846 on effects upon	EARTH AXIS Dimensions, volume 65, number 3 [PB81-235053] PO161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Water-related constraints to the development of geothermal electric generating stations [DE81-025138] Baritime support for ocean-resources development [AD-A104730] Creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program, 1964-79
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel dragon (DE81-028391) DRY HEAT Hot dry rock geothermal energy dever (LA-UR-81-1265) DRYING Solar-supplemented, natural air dry corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW Optimization of flow passage geometair-heating, plate-type sclar columns End region and current consolidation the performance of an MED channel	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265 try for llectors p0055 A82-14846 on effects upon	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces P0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Water-related constraints to the development of geothermal electric generating stations [DE81-025138] Baritime support for ocean-resources development [AD-A104730] Creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program, 1964-79 [FB81-233918] P0112 N82-13488
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel di [DE81-028391] DRY HEAT Hot dry rock geothermal energy dever [LA-UR-81-1265] DRYING Solar-supplemented, natural air dry corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW Optimization of flow passage geometric air-heating, plate-type solar conceptual design	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 rorlets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265 try for llectors p0055 A82-14846 on effects upon l for the ETF	EARTH AXIS Dimensions, volume 65, number 3 [PB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces P0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH OBBITS Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Vater-related constraints to the development of geothermal electric generating stations [DE81-025138] Haritime support for ocean-resources development [AD-A104730] Creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program, 1964-79 [FB81-233918] Assessment of in-place solution methane in
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for basic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel display (DE81-028391) DRY HRAT Hot dry rock geothermal energy deventable of the constant of the passage geometric of the constant of the performance of an MHD channel conceptual design [NASA-TH-82744]	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265 try for llectors p0055 A82-14846 on effects upon	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] P0 161 N82-15436 EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces P0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] PARTH ORBITS Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] P0150 N82-14202 EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Water-related constraints to the development of geothermal electric generating stations [DE81-025138] DE81-025138] P0107 N82-10561 Haritime support for ocean-resources development [AD-A104730] Creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program, 1964-79 [FB81-233918] Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel di [DE81-028391] DRY HEAT Hot dry rock geothermal energy devention of the economic limitations [PE81-028391] DRYING Solar-supplemented, natural air dry corn: The economic limitations [PE81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW Optimization of flow passage geometric distributions optimization of flow passage geometric distributions air-heating, plate-type solar columns the performance of an HHD channel conceptual design [NASA-TM-82744] DUST	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p017 N82-12404 building p0075 N82-13265 try for llectors p0055 A82-14846 on effects upon l for the ETF p0141 N82-12943	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] EARTH CRUST Beduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] BARTH BESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Water-related constraints to the development of geothermal electric generating stations [DE81-025138] Baritime support for ocean-resources development [AD-A104730] Creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program, 1964-79 [FB81-233918] Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of iturbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel drag [DE81-028391] DRY HEAT Hot dry rock geothermal energy dever [LA-UR-81-1265] DRYING Solar-supplemented, natural air dry corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW Optimization of flow passage geometair-heating, plate-type sclar columns DUCTS End region and current consolidation the performance of an MHD channel conceptual design [NASA-TM-82744] DUST Suppression of coal dust explosion	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p017 N82-12404 building p0075 N82-13265 try for llectors p0055 A82-14846 on effects upon l for the ETF p0141 N82-12943	ERATH AXIS Dimensions, volume 65, number 3 [PB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] p0015 N82-11712 EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] p0150 N82-14202 EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] p0097 N82-10560 Water-related constraints to the development of geothermal electric generating stations [DE81-025138] p0007 N82-10561 Maritime support for ocean-resources development [AD-A104730] creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program, 1964-79 [FB81-233918] p0112 N82-13488 Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] Relational methodology for integrating and
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for chasic aerodynamic properties of turbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel drag (DE81-028391] DRY HEAT Hot dry rock geothermal energy dever [LA-UR-81-1265] DRYING Solar-supplemented, natural air drag corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW Optimization of flow passage geometric distributions of the performance of an MHD channel conceptual design [NASA-TM-82744] DUCTS Suppression of coal dust explosion barrier in a conveyor belt entry	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p0017 N82-12404 building p0075 N82-13265 try for llectors p0055 A82-14846 on effects upon for the ETF p0141 N82-12943 by water	EARTH AXIS Dimensions, volume 65, number 3 [FB81-235053] RARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces P0089 A82-10372 BARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DR81-027131] FARTH ORBITS Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] RARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] Vater-related constraints to the development of geothermal electric generating stations [DR81-025138] Haritime support for ocean-resources development [AD-A104730] Creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program, 1964-79 [FB81-233918] Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DR81-029772] Relational methodology for integrating and analyzing field test and research data
calendar year 1980 [DE81-025862] DOPED CRYSTALS Optimization of transparent electrocells [DE81-023359] DRAG An indoor blade test facility for obsic aerodynamic properties of iturbine airfoils with test result 0015 and a modified section DRILLING Accessing the geothermal resources [DE81-025396] DROPS (LIQUIDS) Soot formation in synthetic fuel drag [DE81-028391] DRY HEAT Hot dry rock geothermal energy dever [LA-UR-81-1265] DRYING Solar-supplemented, natural air dry corn: The economic limitations [PB81-235681] DRYING APPARATUS Air circuit with heating rump [BMFT-FB-T-80-188] Appliance efficiency and the solar [DE81-029073] DUCTED FLOW Optimization of flow passage geometair-heating, plate-type sclar columns DUCTS End region and current consolidation the performance of an MHD channel conceptual design [NASA-TM-82744] DUST Suppression of coal dust explosion	p0031 N82-15554 ode for solar p0063 N82-10507 determining the Darrieus wind ts for an NACA p0136 N82-10005 p0116 N82-14614 roplets p0092 N82-10150 elopment program p0097 N82-10560 ying of shelled p0079 N82-14668 p017 N82-12404 building p0075 N82-13265 try for llectors p0055 A82-14846 on effects upon l for the ETF p0141 N82-12943	ERATH AXIS Dimensions, volume 65, number 3 [PB81-235053] EARTH CRUST Reduced heat flow - Mean heat flow relationship for the continental geothermal provinces p0089 A82-10372 EARTH MOVEMENTS Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] p0015 N82-11712 EARTH ORBITS Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Comparative analyses of space-to-space central power stations [NASA-TF-1955] p0150 N82-14202 EARTH RESOURCES Hot dry rock geothermal energy development program [LA-UR-81-1265] p0097 N82-10560 Water-related constraints to the development of geothermal electric generating stations [DE81-025138] p0007 N82-10561 Maritime support for ocean-resources development [AD-A104730] creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program, 1964-79 [FB81-233918] p0112 N82-13488 Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] Relational methodology for integrating and

SUBJECT INDEX RPPICIBNCY

COLOGY - Bcological effects assessment: Requirements vs	Project impact analysis as an optimal control problem irrigation and hydroelectric power
state-of-the-art	project [DE81-028465] p0021 N82-12842
[DE81-028092] CONOMETRICS **Models for forecasting energy use in the US farm	[DE81-028465] p0021 N82-12842 Barriers to the utilization of synthetic fuels for transportation
sector	[NASA-CR-165517] p0023 N82-13243
[DE81-904220] p0018 N82-12580 CONOMIC ANALYSIS	Energy and development in Central America. Volume 2: Country assessments
Net energy analysis of small wind energy conversion systems	[PB81-231557] p0032 N82-15590 BCONONIC FACTORS
p0121 A82-11389	Factors in the development of a major US synthetic
The economic implications of the exergy and thermal efficiencies of energy conversion systems	fuels industry p0001 A82-11545
p0121 A82-11702 Alkaline solution water electrolysis - *81	Modelling energy-economic interactions in developing countries: A linear-programming
p0083 A82-11786 Photovoltaic system studies and developments	approach [DE81-026048] p0020 N82-12637
p0049 A82-11804 Wind energy for the Federal Republic of Germany	Energy and development in Central America. Volume 1: Regional assessment
p0130 A82-14358 OBSYS: A simulation tool for nonconventional	[PB81-231540] p0032 N82-15589 Energy and development in Central America. Volume
energy applications analysis. Theoretical and	2: Country assessments
operational description with user documentation	[PB81-231557] p0032 N82-15590 RCONONIC IMPACT
[DE81-029701] p0007 N82-10514 Technical and economic assessment of solar	Incorporation and impact of a wind energy
thermophotovoltaic conversion	conversion system in generation expansion planning
[DE81-803762] p0064 N82-10515 Economic analysis of the unified heliostat array	p0004 A82-15068 Potential dynamic impacts of wind turbines on
[DE81-026698] p0064 N82-10516	utility systems
Annual cycle energy system [DE81-024911] p0007 N82-10552	p0131 A82-15077 Near-term goals for alcohol fuels from biomass:
Algorithm for computing in-situ combustion oil	An overview of resource requirements, land use,
recovery performance [DE81-030340] p0098 N82-11153	environmental, and socioeconomic impacts ethyl alcohol production
Technical and economic aspects of hydrogen storage	[DE81-029987] p0010 N82-11245
in metal hydrides	Solar Heating And Cooling Of Buildings (SHACOB):
[NASA-TM-76610] p0086 N82-11223 Conceptual design for a multi-user medium BTU coal	Regurrements definition and impact analysis-2. Volume 1: Energy-conserving design for
gasification complex. Volume 1: Executive	residential structures
summary [DE81-027139] p0101 N82-11238	[DE82-900206] p0017 N82-12278 Solar Heating And Cooling Of Buildings (SHACOB):
Low/medium-Btu coal-gasification assessment	Requirements definition and impact analysis-2.
program for specific sites of two New York utilities	Volume 2: Comestic hot water systems [DE82-900207] p0071 N82-12279
[DE81-025518] p0101 N82-11240	Solar Heating And Cooling Of Buildings (SHACOB):
Assessment of oil-shale technology in Brazil	Requirements definition and impact analysis-2.
[DE81-027574] p0010 N82-11249 Alcohol fuels in the United States	Volume 3: Customer load management systems [DE82-900208] p0071 N82-12280
[DE81-026013] p0010 N82-11265	Project impact analysis as an optimal control
Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564	<pre>problem irrigation and hydroelectric power project</pre>
Photovoltaic market analysis program: Background,	[DE81-028465] p0021 H82-12842
model development, applications and extensions [DB81-029711] p0073 N82-12609	Analysis of potential cogeneration impacts on electricity generation by the Central Maine
Near-term improvements in parabolic troughs: An	Power Company
economic and performance assessment	[DE81-029991] p0028 M82-14650 Economic effects induced by ESA contracts, phase
[DB82-001158] p0073 N82-12615 Economic implications of passive-sclar retrofit	2. Volume 1: Summary
for single-family residences in Albuquerque, New	[ESA-CR(P)-1462-VOL-1] p0161 N82-1498
Mexico: A case study [DE81-028402] p0074 N82-12630	RCONONY Interrelationships of energy and the economy: A
DOE small-hydropower demonstration program	supplement to the National Energy Policy Plan
[DE81-027819] p0020 N82-12636 Environmental and economic comparison of advanced	required by Title VIII of the US Department of Energy Organization Act (Public Law 95-91)
processes for conversion of coal and biomass	[DE81-027526] p0013 N82-11613
into clean energy [PB81-234239] p0023 N82-13256	Project impact analysis as an optimal control problem irrigation and hydroelectric power
Feasibility study for an alcohol-fuels plant for	project project
Buffalo, New York	[DE81-028465] p0021 N82-12842
[DE82-000032] p0114 N82-14377 Solar-supplemented, natural air drying of shelled	Urban ecosystem and resource-conserving urbanism
corn: The economic limitations	in Third World Cities
[PB81-235681] p0079 N82-14668 Moorhead district heating, phase 2	[DE81-029854] p0016 M82-11995 Peat deposits of Dismal Swamp pocosins: Camden,
[DE81-029689] p0031 N82-15556	Currituck, Gates, Pasquotank, and Perquimans
Wind speed simulation for economic evaluation of wind energy conversion systems	Counties, North Carolina [DE81-029642] p0109 N82-12524
[DE81-030077] p0119 N82-15560	Ecological effects assessment: Requirements vs
Micro-hydropower in the United States [DE81-028271] p0031 N82-15567	state-of-the-art [DE81-028092] p0032 N82-15598
Methodology and basic algorithms of the Livermore	EDUCATION POUSZ ROZ-15550
Economic Modeling Systems	Education and training implications of biomass
CONONIC DEVELOPMENT	energy system use [DE81-029956] p0028 N82-14664
MASEC industrial fuel-wood program	BPFICIENCY
[DE82-000461] p0110 N82-12595	Rectenna session: Micro aspects p0149 N82-12562
•	•

Session on solid state: Introduction p0149 N82-12565	<pre>Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell</pre>
Modified reference SPS with solid state	p0060 A82-17650
transmitting antenna	Dimensions, volume 65, number 3
p0149 H82-12566 EFFLUENTS	[PB81-235053] p0161 N82-15436 ELECTRIC GENERATORS
H-Coal product physical properties measurement [DE81-029095] p0111 M82-13245	A hidden advantage of permanent magnet electrical generating systems
RLASTIC PROPERTIES	p0122 A82-11720
Bounds and exact theories for the transport properties of inhomogeneous media	Small sodium sulfur battery for solar and wind energy systems
p0056 A82-15607	p0047 A82-11778
Puture of electricity for automobiles: Advanced	Conceptual design of 500 to 3000 hp Stirling engines for stationary power generation p0123 A82-11807
electric vehicle concepts . [DE81-028235] p0029 N82-14987	High temperature cogeneration with thermionic
ELECTRIC BATTERIES	burners
A photovoltaic system with energy storage - Natural Bridges National Monument 100-kW system	p0124 A82-11817 Design considerations for small wind energy
[AIAA PAPER 82-0066] p0155 A82-17763	conversion and storage systems
Status of the DOE battery and electrochemical	p0126 A82-11831
technology program 2	Photovoltaics, the solar electric solution p0050 A82-12532
[DE81-029879] p0156 N82-10540 Status of nickel/zinc and nickel/ircn battery	Control of new energy sources in an electric
technology for electric vehicle applications	utility system
[DR81-023572] p0157 N82-10962	p0154 A82-13082
Overview of the applied battery and electrochemical research program	Towards a high-temperature solar electric converter p0056 A82-15903
[DE81-027397] p0158 N82-11594	Turbines in the ocean
Performance of advanced chromium electrodes for	p0132 A82-16844
the NASA Redox Energy Storage System [NASA-TH-82724] p0159 N82-12574	The generation of current from hydrogen p0085 A82-17131
Puture of electricity for automobiles: Advanced	Integration of decentralized generators with the
electric vehicle concepts	electric power grid
[DE81-028235] p0029 N82-14987 ELECTRIC COMDUCTORS	[DE81-029731] p0006 N82-10334 OESYS: A simulation tool for nonconventional
High pressure MHD coal combustors investigation,	energy applications analysis. Theoretical and
phase 2	operational description with user documentation
[DE81-027238] p0138 H82-10888 ELECTRIC CONTACTS	[DB81-029701] p0007 N82-10514 Preliminary evaluation of advanced coal-based
Laser bonded n-Gals/p-GaSb heterojunction	electricity-generating technologies by means of
intercell Ohmic contact	system-integration analysis
p0041 A82-10776 Effects of processing parameters on thick film	[DE81-029989] p0105 N82-11573 Security assessment of power systems including
inks used for sclar cell front metallization	energy storage and with the integration of wind
p0058 A82-16474	energy
Development of an all-metal thick film cost effective metallization system for solar cells	[DE81-030166] p0140 N82-12590 Economic assessment of advanced central-receiver
[NASA-CR-165043] p0078 N82-14630	solar-thermal power systems: Executive summary
BLECTRIC CUBRENT	[DOB/SF-10601/0] p0074 N82-12624
Investigations of the OCVD transients in solar cells Open Circuit Voltag∈ Decay	Experimental and analytical investigation of a fluidic power generator
p0043 A82-11334	[JPL-PUB-81-100] p0142 N82-13386
Multijunction high Voltage concentrator solar cells	A preliminary estimate of future communications
p0047 A82-11796 Loading schemes for a 50 MW/th/ diagonally	traffic for the electric power system [NASA-CR-165015] p0024 N82-13493
connected MHD generator	Alternate hybrid power sources for remote site
[AIAA PAPEE 82-0395] p0135 A82-17923	applications
Biffect of positive pulse charge waveforms on the energy efficiency of lead-acid traction cells	[AD-A099471] p0024 N82-13512 ELECTRIC HYBRID VEHICLES
[NASA-TH-82709] p0155 N82-10503	Electric and hybrid vehicles environmental control
Solar Heating And Cooling Cf Buildings (SHACOB):	subsystem study
Requirements definition and impact analysis-2. Volume 3: Customer load management systems	[NASA-CR-164995] p0020 N82-12657 Electric and hybrid vehicle environmental control
[DE82-900208] p0071 N82-12280	subsystem study
Two-dimensional effects in power take-off region	[NASA-CR-164996] p0020 N82-12658
[DE82-000091] p0141 B82-13367 ELECTRIC EMERGY STORAGE	Puture of electricity for automobiles: Advanced electric vehicle concepts
Techniques and applications of pulsed power	[DE81-028235] p0029 N82-14987
technology	ELECTRIC MOTOR VEHICLES
p0153 A82-11722 Design considerations for small wind energy	<pre>Effect of depth of discharge on cycle life of near-term batteries</pre>
conversion and storage systems	p0153 A82-11714
p0126 A82-11831 Review of electrochemical energy conversion and	Fundamental investigations on fuel cells for transportation applications
storage for ocean thermal and wind energy systems	p0137 N82-10493
p0126 A82-11832	Rapid charging of lead-acid batteries for
The new batteries	electric-vehicle propulsion and solar-electric
p0154 A82-13325 The generation of current from hydrogen	storage [DB81-028084] p0157 #82-10548
p0085 A82-17131	Hear-term batteries for electric vehicles
Energy storage systems for terrestrial solar	[DE81-023543] p0157 #82-10556
generators cadmium/mercury oxide cells [BMFT-PB-T-81-082] p0080 M82-15529	<pre>Becent progress in lithium/iron sulfide battery development</pre>
ELECTRIC FIELDS	[DB81-023127] p0157 H82-10557
Vertical solar cell and internal electric field	Status of nickel/zinc and nickel/iron battery
p0042 A82-11189 Theory of back surface field silicon solar cells	technology for electric vehicle applications [DB81-023572] p0157 B82-10962
p0056 A82-15447	[320 1002 1002 Policy BOZ 10002

Design study of a continuously variab	le roller
cone traction CVT for electric vehi	
[NASA-CR-159841] RLECTRIC POTRETIAL	p0159 N82-12445
The optimization of solar conversion	devices
	p0039_A82-10025
High- and low-resistivity sulicon sol	
ELECTRIC POURE	p0046 A82-11762
High power solar array switching regu	lation
,	p0045 A82-11736
The all electric airplane - Its devel	opment and
logistic support	-000# 100 4#700
Rnergy technology WIII: New fuels era	p0004 A82-14709
Energy technology VIII: New fuels era of the Eighth Conference, Washington	D. DC. March
9-11, 1981	-,,
	P0004 A82-14925
Models for forecasting energy use in	the US farm
sector [DB81-904220]	p0018 N82-12580
ELECTRIC POWER PLANTS	P0010 H02-12300
Prospects for the development of sola	r energy in
the USSE Production of electric por	
thermodynamics methods	
Dogina al	p0039 A82-10385
Regime Characteristics of a solar the generator and comparison of experis	
calculated data	CECEL GEG
	p0040 A82-10390
Testing of the U.S. Solar Pilot Plant	
[ASME PAPER 81-SOL-3]	p0041 A82-10971
The economic implications of the exer thermal efficiencies of energy conv	gy and
cucradi elliciencies of energy con-	p0121 A82-11702
The Texas Instruments Solar Energy Sy	
development	•
0	p0047 A82-11773
Ground-mounted thermal storage for the dish solar collector/Stirling engine	e parabolic
dish solar corrector/stilling engin	p0047 A82-11781
Control system development for a 1 H	
thermal power plant	• • • • • • • • • • • • • • • • • • • •
	p0048 A82-11801
Dynamic performance analysis for the	solar hybrid
repowering of the El Paso Electric Newman Unit No. 1	сомрану
nesadi onit so. I	p0048 A82-11802
An evaluation of alternate system cor	
for solar repowering electric power	plants
Gameratus 3 2 - 1	p0048 A82-11803
Conceptual design of a large coal-fix Stirling engine	ed stationary
stilling engine	p0123 A82-11806
Thermionic combustor application to	
and steam turbine power plants	
11	p0124 A82-11818
Applications of thermoelectrics to go	OCTUBLE
energy conversion	p0125 A82-11824
Present status of Florida Power Corp.	ration's
D.O.E. funded feasibility study of	the Higgins
plant repowering/coal gasification	
Status report on Central Maine Power	p0089 A82-11834
Funded feasibility study of the Sea	
integrated gasification combined c	
	p0089 A82-11835
Coal fired air turbine cogeneration	0000 000 44000
Planning an underground pumped hydro	p0089 A82-11836
the Commonwealth Edison Company	brolect for
	p0154 A82-11847
High-temperature sclar central receive	rers
Colon name at the colon of the	p0052 A82-12949
Solar perspectives - Israel, solar pe	ond innovator p0052 A82-12950
System of tolerances for a solar-towe	
4	
	p0053 A82-13717
Mathematical simulation model for the	p0053 A82-13717 operation of
Mathematical simulation model for the the optical system of a solar power	p0053 A82-13717 coperation of station
the optical system of a solar power	p0053 A82-13717 coperation of station p0053 A82-13718
the optical system of a solar power Proposed 12.5 MWe shelf-mounted OTEC	p0053 A82-13717 coperation of station p0053 A82-13718 pilot plant
the optical system of a solar power	p0053 A82-13717 coperation of station p0053 A82-13718 pilot plant
the Optical system of a solar power Proposed 12.5 MWe shelf-mounted OTEC for power, water and mariculture at [AIAA PAPRE 81-2546] Proposed 10 MWe OTEC pilot plant for	p0053 A82-13717 e operation of t station p0053 A82-13718 pilot plant t St. Croix p0127 A82-14011 the
the Optical system of a solar power Proposed 12.5 MWe shelf-mounted OTEC for power, water and mariculture at [AIAA PAPEE 81-2546] Proposed 10 MWe OTEC pilot plant for Commonwealth of the Northern Maria:	p0053 A82-13717 e operation of c station p0053 A82-13718 pilot plant t St. Croix p0127 A82-14011 the pa Islands
the Optical system of a solar power Proposed 12.5 MWe shelf-mounted OTEC for power, water and mariculture at [AIAA PAPRE 81-2546] Proposed 10 MWe OTEC pilot plant for	p0053 A82-13717 e operation of t station p0053 A82-13718 pilot plant t St. Croix p0127 A82-14011 the

```
An estimate of OTEC costs, market potential and
  proof-of-concept vessel financing [AIAA PAPER 81-2567]
                                             p0003 A82-14024
The transformation of wind energy by a high
  altitude power plant /HAPP/
[AIAA PAPER 81-2568]
                                             p0128 A82-14025
Assessment of MHD power plants with coal
  gasification
  [AIAA PAPER 81-2574]
                                             p0129 A82-14030
A design for an MHD power plant as a prime mover
for a Naval Vessel
[AIAA PAPER 81-2575] p0129 A82-14
Problems and potential for MHD retrofit of
  existing coal-fired plants [AIAA PAPER 81-2586]
                                             p0130 A82-14036
OTEC ocean system development
  [ AIAA PAPER 81-2590]
                                             p0130 A82-14038
Turboexpanders for OTEC power plants
  [AIAA PAPER 81-2592]
                                             P0003 A82-14040
Energy transfer in wind-assist electric power
  systems
Incorporation and impact of a wind energy
  conversion system in generation expansion planning
                                             p0004 A82-15068
Carbonate fuel cell power plant systems
p0131 A82-15069
The electric utility 4.5 MW fuel cell power plant
- An urban demonstration
                                             p0131 A82-15070
Potential dynamic impacts of wind turbines on
  utility systems
                                             p0131 A82-15071
North American tidal power prospects
                                             p0131 A82-15667
Model calculations of the chemical processes
  occurring in the plume of a coal-fired power plant
                                             p0005 A82-16342
The design of a sodium-cooled 2.7 MW receiver for
  a solar power plant
                                             p0059 A82-17126
Solar-thermal experimental projects on the Spanish
   Plataforma Solar
                                             p0059 A82-17128
The Rl Paso electric 20-kilowatt photovoltaic system
[AIAA PAPER 82-0064] p0060 A82-17
The Mt. Laguna photovoltaic project
[AIAA PAPER 82-0065] p0061 A82-17
A photovoltaic system with energy storage -
Natural Bridges National Monument 100-kW system
                                             p0060 A82-17761
                                             p0061 182-17762
  [AIAA PAPER 82-0066]
                                             p0155 A82-17763
The Lea county electric 100-kilowatt grid-connected photovoltaic system [AIAA PAPER 82-0067]
                                             p0061 A82-17764
Startup experience with a concentrating
  photovoltaic power system
[AIAA PAPER 82-0068] p0061 A82-1
Optical diagnostic techniques for coal-fired MHD
                                             p0061 A82-17765
  applications
  [AIAA PAPER 82-0377]
MHD generator scaling analysis for baseload
  commercial power plants [AIAA PAPER 82-0394]
                                              p0135 A82-17922
Electric utility modeling extensions to evaluate
  solar plants
                                             D0061 A82-18025
A simplified model of the thermohydraulic
  behaviour of a linear collector network for the
  conversion of the solar energy
                                             p0062 A82-18816
Magnetohydrodynamics MHD Engineering Test Facility
  Engineering Report CDER. Volume 3: Costs and
   schedules
  [NASA-CR-165452-VOL-3]
                                             p0137 N82-10495
Large wind turbine generator performance
  assessment, technology status report no. [DE81-903763] p0137
Peasibility of a small scale pumped storage demonstration project.
  demonstration project, Hibbing, Minnesota
  [DE81-028678]
                                             p0155 N82-10525
Preliminary design study of underground pumped
hydro and compressed-air energy storage in hard
rock. Volume 3: Project design criteria: CAE
  [DE81-028197]
                                             p0156 N82-10546
Low/medium-Btu coal-gasification assessment
  program for specific sites of two New York
   utilities
  [ DB81-0255181
                                             p0101 N82-11240
```

Possible use of coal in Hawaii, 1980 - 2000	Configuration selection study for isolated loads
[DE81-028266] p0010 N82-11263 Magnetohydrodynamics (MMD) Engineering Test	using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223
Pacility (ETF) 200 MWe power plant. Design	Electric power supply and demand for the
Requirements Document (DRD)	contiguous United States, 1981 - 1990
[HASA-TH-82705] p0140 H82-12446	[DE81-027126] p0012 N82-11376
Geothermal reservoir assessment: Northern basin	Innovative equipment for small-scale hydro
and range province Stillwater prospect,	developments [pE81-027820] p0141 H82-12634
Churchill County, Nevada [DE82-000529] p0109 N82-12516	[DE81-027820] p0141 H82-12634 Experimental and analytical investigation of a
Magnetohydrodynamics (MHD) Engineering Test	finidic power generator
Pacility (ETF) 200 MWe rower plant. Conceptual	[JPL-PUB-81-100] p0142 N82-13386
Design Engineering Report (CDER). Volume 1:	Pulsed Power Research colloquium
Executive summary	[AD-A105770] p0150 N82-14638
[NASA-CR-165452-VOL-1] p0140 N82-12570	BLECTRIC POWER TRANSMISSION
Security assessment of power systems including energy storage and with the integration of wind	Integration of decentralized generators with the electric power grid
energy	[DE81-029731] p0006 N82-10334
[DE81-030166] p0140 N82-12590	Project demonstration of wind-turbine electricity:
Investigation and research of specific	Interconnecting a northern Michigan fruit farm
combustion-turbine and combined-cycle field	with a major utility
problems [DE81-904231] p0141 N82-12592	[DE81-030950] p0138 N82-11380 Distributed photovoltaic systems: Utility
Comparative economics of sclar thermal central	interface issues and their present status
receivers	[NASA-CR-165019] p0076 N82-13492
[DE81-029623] p0072 H82-12601	ELECTRIC PULSES
Solar thermal central receivers for industrial	Techniques and applications of pulsed power
process heat generation: User views and	technology
recommendations for commercialization [DE81-029611] p0073 N82-12618	p0153 A82-11722 BLECTRICAL FAULTS
Solar project at Almeria nears completion	Investigations of the OCVD transients in solar cells
p0075 #82-12647	Open Circuit Voltage Decay
A computer simulation modeling study to predict	p0043 A82-11334
air quality impacts from a 500 MW coal-fired	Performance of terrestrial photovoltaic modules at
power plant	MIT Lincoln Laboratory experimental photovoltaic systems
Distributed photovoltaic systems: Utility	[DE81-029995] p0064 N82-10519
interface issues and their present status	BLECTRICAL HEASUREHERT
[NASA-CR-165019] p0076 N82-13492	Low frequency capacitance characterizations on
Compressed air energy storage: Preliminary design	indium/x-phase of metal free phthalocyanine
and site development program in an aquifer.	solar cells p0053 A82-13806
Volume 2: Utility system planning [DE82-000466] p0159 N82-13544	Improved technique to measure electronically AC
Chemical element concentrations in liquids and	losses in superconducting cables
solids associated with power plants using FGD	[DB81-029323] p0150 N82-15338
systems	BLECTRICAL PROPERTIES
[DE81-030422] p0027 N82-14322	Electrical characteristics of high-voltage
Evaluation of coal gasification/combined cycle power plant feasibility at the Sewells Point	germanium photoconverters under high illumination intensities
Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639	p0040 A82-10391 Electrical properties of infrared photovoltaic
Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639 Need for power and the choice of technologies:	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] p0080 N82-15532	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty.	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Eg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating E and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] P0080 W82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty, Volume 2: Atmospheric fluidized-bed combustion commercialization strategies	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] p0035 N82-16012	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] P0080 W82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty, Volume 2: Atmospheric fluidized-bed combustion commercialization strategies	p0040 A82-10391 Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BHTT-FB-T-81-101] P0080 W82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion Flanning model	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0 136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0 062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0 051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0 058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-PD-T-81-168] ELECTRICAL RESISTIVITY
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DE81-904237] P0035 N82-16013	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0 136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMPT-PB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DE81-904237] ELECTRIC POWER SUPPLIES	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells
Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639 Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644 Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] p0080 N82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Evaluating E and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] p0035 N82-16012 Evaluating E and D options under uncertainty. Volume 3: An electric-utility generation-expansion flanning model [DE81-904237] p0035 N82-16013 ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0 136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0 62 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-PB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [WASA-CR-164945] p0067 W82-11548
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DE81-904237] ELECTRIC POWER SUPPLIES	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion flanning model [DE81-904237] ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems P0121 A82-11389 NASA preprototype redox storage system for a	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0 136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FD-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [MASA-CR-164945] Amorphous boron-silicon-hydrogen alloys for
Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639 Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644 Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] p0080 N82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Evaluating B and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE61-904246] p0035 N82-16012 Evaluating B and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DE81-904237] p0035 N82-16013 ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems p0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0 136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0 062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0 051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0 058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-PB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [NASA-CR-164945] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027234] Amorphous boron-silicon-hydrogen alloys for
Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639 Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644 Development of a prototype of a 10 kW small solar power plant technology for developing nations [BHTT-FB-T-81-101] p0080 N82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] p0035 N82-16012 Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion flanning model [DE81-904237] ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems P0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0 136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0 062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0 051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0 058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [MASA-CE-164945] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DB81-027234] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells
Naval Complex, Norfolk, Virginia [AD-1103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DE81-904237] ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems P0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application P0153 A82-11774 Semiconductor converters/inverters for	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL HESISTABCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [MASA-CR-164945] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027234] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027254] p0068 M82-11558
Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639 Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644 Development of a prototype of a 10 kW small solar power plant technology for developing nations [BHTT-FB-T-81-101] p0080 N82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] p0035 N82-16012 Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion flanning model [DE81-904237] ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems P0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0 136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0 062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0 051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0 058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [MASA-CE-164945] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DB81-027234] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells
Naval Complex, Norfolk, Virginia [AD-1103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DE81-904237] ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems p0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application p0153 A82-11774 Semiconductor converters/inverters for photovoltaic power supply p0126 A82-11857 Solar thermal cost goals - Implementing a	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-PB-T-81-168] p0030 N82-15168 ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [DE81-027234] p0067 N82-11548 Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027254] p0068 N82-11557 Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027254] p0068 N82-11558 ELECTRICITY Engineering challenges of fusion-reactor development [DE81-024129] p0139 N82-11907
Naval Complex, Norfolk, Virginia [AD-A103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DE81-904237] ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems P0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application p0153 A82-11774 Semiconductor converters/inverters for photovoltaic power supply P0126 A82-11857 Solar thermal cost goals - Implementing a methodology for assessing break-even value and	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-PB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [MASA-CR-164945] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DB81-027234] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DB81-027254] ELECTRICITY Engineering challenges of fusion-reactor development [DB81-024129] ELECTRIFICATION
Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639 Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644 Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] p0080 N82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE61-030073] p0033 N82-15610 Evaluating E and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion flanning model [DE81-904237] p0035 N82-16013 ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems p0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application p0153 A82-11774 Semiconductor converters/inverters for photovoltaic power supply p0126 A82-11857 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-PB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [MASA-CR-164945] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027234] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027254] ELECTRICITY Engineering challenges of fusion-reactor development [DE81-024129] ELECTRIFICATION Barket assessment of photovoltaic power systems
Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639 Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644 Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] p0080 N82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Evaluating B and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] p0035 N82-16012 Evaluating B and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DE81-904237] p0035 N82-16013 ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems p0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application p0153 A82-11774 Semiconductor converters/inverters for photovoltaic power supply p0126 A82-11857 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0 136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0 062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0 051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0 058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-61-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [MASA-CR-164945] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027234] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027254] ELECTRICITY Engineering challenges of fusion-reactor development [DE81-024129] ELECTRIFICATION Market assessment of photovoltaic power systems for agricultural applications in Mexico
Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639 Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644 Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] p0080 N82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE61-030073] p0033 N82-15610 Evaluating E and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion flanning model [DE81-904237] p0035 N82-16013 ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems p0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application p0153 A82-11774 Semiconductor converters/inverters for photovoltaic power supply p0126 A82-11857 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL RESISTANCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-PB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [MASA-CR-164945] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027234] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027254] ELECTRICITY Engineering challenges of fusion-reactor development [DE81-024129] ELECTRIFICATION Barket assessment of photovoltaic power systems
Naval Complex, Norfolk, Virginia [AD-1103674] Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMFT-FB-T-81-101] P0080 N82-15532 Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DE81-904237] ELECTRIC POWER SUPPLIES Net energy analysis of small wind energy conversion systems P0121 A82-11389 NASA preprototype redox storage system for a photovoltaic stand-alone application p0153 A82-11774 Semiconductor converters/inverters for photovoltaic power supply Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] The all-electric airplane - A new trend	Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 ELECTRICAL HESISTABCE Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 A method for experimental assessment of the shifting approximation, with application to polysilicon solar cells effect of constant series resistance p0058 A82-16131 Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-PB-T-81-168] ELECTRICAL RESISTIVITY The effects of impurities on the performance of silicon solar cells [MASA-CR-164945] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027234] Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027254] ELECTRICITY Engineering challenges of fusion-reactor development [DE81-024129] P0139 N82-11558 ELECTRIFICATION Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441]

SUBJECT INDEX ELECTRONIC CONTROL

Energy savings by means of fuel-cell electrodes in Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p003 electro-chemical industries [DE81-030975] p0018 N82-12582 p0030 N82-15168 Development of a high-temperature durable catalyst BLECTROLYTES for use in catalytic combustors for advanced Development status of the General Electric solid automotive gas turbine engines polymer electrolyte water electrolysis technology [NASA-CR-165396] D0142 N82-13510 --- hydrogen production BLECTROCHEMICAL CELLS p0083 A82-11787 Recent progress on the development of the Dow Evaluation of organic acids as fuel cell hollow fiber sodium-sulfur battery electrolytes p0123 A82-11777 p0127 A82-12938 Review of electrochemical energy conversion and Oxide optimization at the p-Si/aqueous electrolyte storage for ocean thermal and wind energy systems interface p0126 A82-11832 p0052 A82-13199 Investigation of the performance of an MoS2/I-/I2/C electrochemical solar cell Investigation of the performance of an MoS2/I-/I2/C electrochemical solar cell p0053 A82-13805 p0053 A82-13805 Photoelectrochemical cells using polycrystalline **ELECTROLYTIC CELLS** and thin film MoS2 electrodes The new batteries D0057 A82-16053 p0154 A82-13325 Photocorrosion of strontium titanate photoanoges Halogen acid electrolysis in solid polymer p0057 182-16056 electrolyte cells Status of the DOE battery and electrochemical p0084 A82-16346 technology program 2 [DE81-029879] Status of the DOE battery and electrochemical P0156 N82-10540 technology program 2 [DE81-029879] p0156 N82-10540 Electrochemical photovoltaic cells Recent advances in lead-acid cell research and [DE81-7697C4] p0066 N82-10568 Calcium/metal sulfide battery development program development p0158 N82-11578 [DE81-023104] [ANL-81-14] ELECTROCHEMICAL CORROSION p0158 N82-11580 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] ELECTROMAGERTIC ABSORPTION Photocorrosion of strontium titanate photoanodes p0143 N82-14666 p0057 A82-16056 RLECTROCHEMISTRY The optical properties-microstructure relationship in particulate media - Optical tailoring of Evaluation of organic acids as fuel cell electrolytes solar absorbers p0127 A82-12938 Investigation of the zinc electrode reaction ---A theoretical study of microwave beam absorption nickel zinc batteries [DE81-030221] by a rectenna p0157 N82-11368 p0149 N82-12563 Overview of the applied battery and ELECTROMAGNETIC ACCELERATION electrochemical research program Possible application of electromagnetic guns to [DE81-027397] p0158 N82-11594 impact fusion RLECTROCONDUCTI VITY p0135 A82-18201 Study of the electric conductivity of plasma from fuel combustion products containing a weakly ionizing impurity BLECTROMAGNETIC COMPATIBILITY effects of the Satellite Power System on low Earth orbit and geosynchronous satellites [PB81-232019] p0150 N82-13157 P0091 A82-12888 ELECTRODES BLECTRONAGNETISE Photoelectrochemical cells using polycrystalline Conceptual design of superconducting magnet system for Magnetohydrodynamic (MHD) Engineering Test Pacility (ETF) 200 MWe power plant [NASA-CR-165053] p0143 N82-14 and thin film MoS2 electrodes p0057 A82-16053 n0143 N82-14520 Key contributions in MHD power generation p0138 N82-10882 ELECTRON BOMBARDMENT [DE81-028121] Investigation of the zinc electrode reaction --A study of the purification process during the nickel zinc tatteries elaboration by electron bombardment of [DE81-030221] polysilicon ribbons designed for photovoltaic Performance of advanced chromium electrodes for the NASA Redox Energy Storage System conversion p0057 A82-16054 [NASA-TM-82724] p0159 N82-125 Energy savings by means of fuel-cell electrodes in p0159 N82-12574 ELECTRON DIFFUSION Dependence of minority carrier diffusion length on electro-chemical industries illumination level and temperature in single [DE81-030975] p0018 N82-12582 crystal and polycrystalline Si solar cells Electrical effects of slag in a diffuse mode p0053 A82-13804 magnetohydrodynamic generator RIECTRON ENERGY D0143 N82-13550 Investigation of direct solar-to-microwave energy conversion techniques [NASA-CR-161883] ELECTRODYBANICS Increasing power and efficiency by dynamic suppression of ichization instability in a plasma BLECTRON MICROSCOPY P0127 A82-12897 Characterization of selective solar absorber microstructures - Electron microscope studies RLECTROLYSIS Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0060 A82-17254 ELECTRON MOBILITY P0083 A82-11785 Vertical solar cell and internal electric field p0042 A82-11189 Alkaline solution water electrolysis p0083 A82-11786 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production BLECTRONIC AIRCRAFT P0083 A82-11787 The role of avionics in the all electric airplane [AIAA 81-2219] Solar hydrogen system design considerations p0002 A82-13457 p0084 A82-11788 The all electric airplane - Its development and Halogen acid electrolysis in solid polymer logistic support electrolyte cells D0004 A82-14709 ELECTRONIC CONTROL D0084 A82-16346 Hydrogen from solar energy Ampere-hour integrator battery charge controller p0085 A82-17129 p0153 A82-11737 Thermochemical processes for hydrogen production Control system development for a 1 MW/e/ solar by water splitting - From theory to practice thermal rower plant p0048 A82-11801

p0086 A82-18392

ELECTROBIC EQUIPMENT Lightning protection for wind turbing			ence 079 182-14656
[AIAA PAPEE 81-2571] Study of photovoltaic cost elements.	p0129 A82-14028 Volume 1:	Sampling design for the 1980 connercial	
Executive report. Volume 2: Proje	ect background p0069 N82-11566	<pre>multifamily residential building surve [DE81-028783] por</pre>	ey 011 882-11320
Study of photovoltaic cost elements. Sandia National Laboratories photo	Volume 3:	Energy analysis for a sample building b proposed ASBRAB simplified method	
systems design catalog [DE81-030986]	p0069 N82-11567	[DE81-027189] p00	012 H82-11323
Study of photovoltaic cost elements. Installation cost model for residen	Volume 4: ntial PV -	Energy conservation through utilization mechanical energy storage	of
systems: Users manual [DE81-031921]	p0069 N82-11568		002 A82-11845 0
Solar cell development for the Power	Extension	p00 Energy technology VII: Expanding supplic	002 182-12563 es and
Package	p0046 A82-11763	conservation; Proceedings of the Sever Conference, Washington, DC, March 24-	26, 1980
RIECTROPHORESIS Separation of particles from coal de	rived liquids	Puel conservation measures in South Afr:	004 182-14924 ican
via surface charge properties [DE81-029088] EMISSION	p0092 N82-10141	airways - A review of activity and a future developments	glimpse of 004 A82-15598
Performance characteristics of automount the United States, third series.		An energy saving transit concept for ne	w towns 005 A82-15665
Chrysler 318 CID (5.2L), 2V. [PB81-233025]	p0023 N82-13435	Fuel conservation now improvements: existing production run transport airc	
Coal resources and sulphur emission : A summary of 8 eastern and midwest.	regulations:		005 182-17281
[PB81-240319] EMISSIVITY	p0031 N82-15514	alcraft fuel management through in-f. monitoring	
The emissivity of metals frequence temperature dependence calculations		p0 Mechanical energy storage technology pro-	005 A82-17282
collector design			155 N82-10508
BHITTANCE	p0038 A82-10014	saving heat supply system for the res	idential
Effect of metal base layer on the ab- emittance of sputtered graded metal		district "Maria Lindenhof" in Dorsten Germany using river water as a he	
selective absorbing surfaces	p0040 A82-10469	and systems engineering	008 N82-10572
BHITTERS	_	Energy consumption and heavy-duty vehic.	
An analytical model for high-low-ema- solar cells in concentrated sunligh	bt		008 N82-10573
EMPLOYMENT	p0055 A82-15441	Effects of atmospheric variability on en utilization and conservation	nergy
Education and training implications of energy system use	of biomass		008 N82-10592
[DE81-029956]	p0028 N82-14664	Section 511 of the Motor Vehicle Info	
EMULSIONS Microemulsions, emulsions and related	d systems:		012 N82-11479
Energy applications	p0113 N82-13545	BPA evaluation of the Automotive Cylinder Deactivator System (ACDS) under Section	
BNCAPSULATING High resolution, low cost solar cell	contact	the Motor Vehicle Information and Cos	
development		Energy programs at the johns hopkins un:	
ENERGY ABSORPTION	p0076 N82-13501		013 N82-11535
Schlumberger resistivity study of the Springs region of northwestern New	Mexico	Modeling energy-conservation potentials community energy-system technologies	
[DE81-025302] ENERGY ABSORPTION FILMS	p0119 N82-15661	[DE81-026059] population populati	013 N82-11589
Composite film selective-absorbers -	for solar	incentives to conservation and	
radiation collection	p0038 A82-10016	alternative-energy use in the residen- in Wisconsin	tial sector
Research and device problems in photo	ovoltaics p0039 A82-10023	[DOE/CS-30292/3] p0 Third automotive fuel economy research	013 N82-11614 contractors
Optical properties of selectively about the chromium films deposited at oblique	sorbing	coordination meeting	014 N82-11627
incidence	-	Solar Heating And Cooling Of Buildings	(SHACOB):
Spectrally selective copper sulphide		Reguirements definition and impact an Volume 1: Energy-conserving design for residential structures	
Effect of metal base layer on the ab		[DE82-900206] p0	017 N82-12278
emittance of sputtered graded meta: selective absorbing surfaces	1-carbon	Air circuit with heating pump [BMFT-FB-T-80-188] p0	017 N82-12404
Solution grown PbS/CdS multilayer st	p0040 <u>182-10469</u> acks as	Passive solar technical planning study [EPRI-BM-1591] po	072 N82-12578
selective absorbers	p0041 A82-10472	Energy savings by means of fuel-cell electro-chemical industries	
Efficiency of selective surfaces for collectors			018 N82-12582
High efficiency thin-film GaAs solar	p0044 A82-11425	substations. Volume 1: Generic stud	
•	p0046 A82-11767	Utilization of waste heat from major tr	ansformer
Optimization of transparent electrode cells	-		019 N82-12594
[DE81-023359] National photovoltaic program in amo	p0063 N82-10507 iphous materials	Passive-solar-retrofit study for the Un. Navy	ited States
[DE81-025906]	p0070 N82-11609		074 N82-12629

SUBJECT INDEX BRENGY CONVERSION

DOE small-hydropower demonstration program Programmer's manual for the DOEHPE (DOE Heat Pump [DE81-027819] p0020: Puel savings in hot water heating plants by p0020 N82-12636 Efficiency) program [DE81-769452] p0007 N82-10551 application of heat rumps operated with natural gas (natural gas heat rump). Project: gas engine [BMPT-PB-T-80-125] Energy consumption and heavy-duty vehicles --tractor trucks p0008 N82-10573 Energy technologies and the environment. Environmental information handbook Bffects of atmospheric variability on energy utilization and conservation p0020 N82-12660
Analysis of integrated fuel-efficient, low-noise
procedures in terminal-area operations
[DE81-0298331 [DE81-026308] [DE81-026308] p0008 N82-10592 Site And Neighborhood Design (SAND): Development of simplified automated building thermal load [DB81-029833] p0022 N82-130 Augmentation of research and analysis capabilities procedures, phase 1 [DE81-027138] p0022 N82-13014 p0011 N82-11317 for timely support of automotive fuel economy Assessment of building diagnostics [DB81-027078] p0012 N Energy analysis for a sample building by the Volume 1: Summary activities. p0012 N82-11321 [PB81-219479] p0022 N82-130 Augmentation of research and analysis capabilities p0022 N82-13018 proposed ASHRAE simplified method [DE81-027189] for timely support of automotive fuel economy p0012 N82-11323 activities. Volume 2: Appendices A through Well-water-source heat pump field performance study p0022 N82-13019 [PB81-219487] p0022 N82-130 Augmentation of research and analysis capabilities [DE81-024136] p0012 N82-11419 Long-term performance of the Hunn passive solar for timely support of automotive fuel economy activities. Volume 3: Appendix D residence [DE81-028735] p0070 N82-11600 Energy conservation in distillation [DE81-028650] [PB81-219495] p0022 N82-13020 Appliance efficiency and the solar building p0018 N82-12581 [DE81-029073] p0075 N82-13265 National interim energy-consumption survey: Exploring the variability in energy consumption [DE81-029910] p0018 #82-12 Annual cycle energy system experimental [DE81-029910] p0018 N82-12589 Guidebook for solar process-heat applications performance and national applicability p0024 N82-13523 [DB81-028570] [DE81-027977] p0072 N82-12598 Ultimate in building energy analysis: DOE-2 and A central microprocessor controlled electrical storage heating system p0025 #82-13547 [BMFT-FB-T-80-182] BLAST [DE81-028703] p0023 'N82-13263 Evaluation of techniques for reducing in-use automotive fuel consumption Appliance efficiency and the solar building [PB81-233298] [DE81-029073] p0026 N82-13985 p0075 N82-13265 Highway fuel economy study [PB81-233850] Water and energy usage in coal preparation p0026 N82-13986 [PB81-238248] p0112 N82-13486 The use of flight management computers in air Need for power and the choice of technologies: carrier operations in the 1980s [AD-A105621] State decisions on electric power facilities [DE81-025960] p0027 N82 D0027 N82-14071 p0027 N82-14644 Residential site design and energy conservation. Projecting regional potentials for cost-effective Part 1: General report energy conservation and renewable resource applications: A feasibility study [DOB/CS-10045/T3] [DE81-904010] p0027 N82-14398 Projecting regional potentials for cost-effective energy conservation and renewable resource p0027 N82-14645 Potential energy savings in the residential sector of the United States [DE81-028873] p0028 N82-14662 applications: A feasibility study [DOE/CS-10045/T3] Theoretical basis of the DOB-2 building energy use p0027 N82-14645 analysis program Analysis of the energy impacts of the DOE [DE81-028896] p0030 N82-15242 Potential contribution of currently operating nuclear-fueled electric-generating units to Appropriate Energy Technology Small Grants Program: Method and results [DE81-029844] reducing US oil consumption p0028 N82-14651 [DE81-030497] p0031 N82-15553 Seminars for private college administrators on solar applications for college buildings Annual report to the President and the Congress on p0079 N82-14661 [DE81-027981] the State Energy Conservation Program for Potential energy savings in the residential sector of the United States calendar year 1980 [DE81-025862] p0031 N82-15554 [DE81-028873] Technology change and energy consumption: A comparison of residential subdivisions P0028 N82-14662 Theoretical basis of the ECE-2 building energy use [DE81-030075] analysis program p0031 N82-15555 p0030 N82-15242 [DE81-028896] Micro-hydropower in the United States Automotive fuel economy: Fotential improvement through selected engine and differential gear [DE81-028271] p0031 N82-15567 Comparative thermal performance of direct gain, Trombe, and sunspace walls lubricants [PB81-240467] p0030 N82-15453 Annual report to the President and the Congress on [DE81-030546] p0081 N82-15571 Energy consumption analysis and comparative study the State Energy Conservation Program for of the operational results from heat pump plants calendar year 1980 [DE81-025862] [BMFI-FB-T-80-109] p0032 N82-15583 Energy and development in Central America. Volume 2: Country assessments p0031 N82-15554 Summary of passive solar multi-family design [PB81-231557] workshops p0032 N82-15590 [DE81-030353] p0081 N82-15564 Fuels and electric energy consumed p0032 N82-15594 ENERGY CONSUMPTION, [PB81-240442] Regional load-curve models: Scenario and forecast using the DRI model
[DB81-904192] p0033 N82-156 Characteristics and trends of energy consumption in transport missions with aircraft and surface p0033 N82-15605 vehicles p0001 A82-10495 EMBRGY CONVERSION Puel and energy --- Book Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volumes 1, 2 & 3 p0004 A82-15589 Plame-retention head burner efficiency test p0121 A82-11701 results and analysis: Space-heating-equipment Satellite power systems /SPS/ energy conversion test program [DE81-030219] p0093 N82-10153 Energy end-use requirements in manufacturing, and power management p0045 A82-11742 volume 3 Semiconductor converters/inverters for [DE81-027976] p0007 N82-10544 photovoltaic power supply D0126 A82-11857

Unconventional techniques of energy conversion	The optimization of solar conversion devices
p0127 A82-13847 Cost estimates for advanced/innovative wind energy	p0039 A82-10025 Photoacoustic figure of merit for photothermal
conversion systems /AWICS/	energy conversion efficiency
[AIAA PAPER 81-2557] p0128 A82-14016 Puels from biomass and wastes Book	p0121 A82-10192 Present state of research on selective coatings
p0091 A82-14986	for solar-energy converters
Fuel and energy Book p0004 182-15589	p0039 A82-10387
Energy and ceramics Book	Regime characteristics of a solar thermoelectric generator and comparison of experimental and
p0005 A82-17076	calculated data
Biomass conversion processes for energy and fuels Book	p0040 A82-10390 Optical degradation of antireflective silica film
p0092 A82-18114	on solar collector windows
A computer model of a stirling engine using a two-phase two-component working fluid	p0041 A82-10836 AAI Corporation receiver design experience in
p0137 N82-10492	concentrating solar collectors
The plasmadynamics and icnization kinetics of thermionic energy conversion	[ASME PAPER 81-SOL-1] p0041 A82-10969 Testing of the U.S. Solar Pilot Plant receiver
p0137 N82-10494 Liquid-metal MHD for solar and coal	[ASME PAPER 81-SOL-3] p0041 A82-10971
[DE81-023545] p0137 N82-10553	Modeling and testing a salt gradient solar pond in northeast Ohio
Economic and environmental tradeoffs in coal conversion	p0043 A82-11210
[CONP-800608-8] p0009 N82-10598	The effect of inclination on the heat loss from flat-plate solar collectors
Analysis of thermal/mechanical energy-conversion	p0043 A82-11212
Concepts [DE81-027854] p0139 N82-11585	Performance analysis of d.cmotor-photovoltaic converter system. II - Series and shunt excited
Residual-energy-applications program:	motors
EAST-facility requirements document [DE81-027489] p0014 N82-11616	p0043 A82-11213 Stability of n-i-p amorphous silicon solar cells
Site selection for small wind energy conversion	p0043 A82-11343
systems for US Department of Energy field evaluation program	Efficient Si solar cells by low-temperature solid-phase epitaxy
[PB81-226862] p0014 N82-11624	p0043 A82-11344
Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1	Net energy analysis of small wind energy conversion systems
[DE82-000808] p0019 N82-12613	p0121 A82-11389
Rate coefficients of combustion/fuel conversion reactions by high-temperature photochemistry	Cascade photogenerators based on silicon and germanium matrix photoconverters
[DE81-027965] p0023 N82-13192 Experimental and analytical investigation of a	p0044 A82-11422
fluidic power generator	Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors
[JPL-PUB-81-100] p0142 N82-13386 Distributed photovoltaic systems: Utility	p0044 A82-11423
interface issues and their present status	Combined solar-energy converters with selective coatings
[NASA-CR-165019] p0076 N82-13492 A preliminary estimate of future communications	p0044 A82-11424 Efficiency of selective surfaces for solar thermal
traffic for the electric power system	collectors .
[NASA-CR-165015] p0024 N82-13493 Technology assessment of solar energy systems:	p0044 A82-11425 Intersociety Energy Conversion Engineering
Availability and impacts of woody biomass	Conference, 16th, Atlanta, GA, August 9-14,
utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535	1981, Proceedings. Volumes 1, 2 & 3 p0121 A82-11701
New and renewable energy in the United States of	The economic implications of the exergy and
America [DE81-030887] p0024 N82-13539	thermal efficiencies of energy conversion systems p0121 A82-11702
Treatment of biomass gasification wastewaters	Direct conversion of light to radio frequency energy
using reverse osmosis [DE82-000698]	using photoklystrons for solar power satellites
Exploratory study of ccal-conversion chemistry	p0045 A82-11712
[DE81-016136] p0119 N82-15552 Potential contribution of currently operating	A hidden advantage of permanent magnet electrical generating systems
nuclear-fueled electric-generating units to	p0122 A82-11720
reducing US cil consumption [DE81-030497] p0031 N82-15553	Cost and performance projections for SPS photovoltaic blankets
Supplement to energy for rural development:	p0045 A82-11741
Renewable resources and alternative technologies for developing countries	Solar panel current degradation factors p0045 A82-11759
[PB81-231011] p0032 N82-15592	High- and low-resistivity silicon solar cells
Symposium proceedings: Environmental aspects of fuel conversion technology, 5th	p0046 182-11762 Thin cells - Their present status and future areas
[PB81-245045] p0034 N82-15623	of development
EBERGY CONVERSION REFFICIENCY Introduction to solar materials science	p0046 A82-11764 GaAs solar cells for space application
p0037 A82-10008	p0046 A82-11766
Solar mirror materials - Their properties and uses in solar concentrating collectors	High efficiency thin-film GaAs solar cells p0046 A82-11767
p0037 A82-10012	The Texas Instruments Solar Energy System
The effect of soiling on sclar mirrors and techniques used to maintain high reflectivity	development p0047 A82-11773
p0037 A82-10013 Fundamental limits to the spectral selectivity of	The development of high efficiency cascade solar cells - An overview
composite materials for absorbing solar	p0047 A82-11794
radlation p0038 A82-10015	High temperature cogeneration with thermionic burners
Research and device problems in photovoltaics	p0124 A82-11817
p0039 A82-10023	

SUBJECT INDEX ENERGY DISSIPATION

The design of series-parallel connected thermionic converter arrays p0124 A82-11820 Reqenerative pyroelectric heat engine p0126 A82-11833 Progress in large area photovoltaic devices based on amorphous silicon alloys p0049 A82-11855 Variable speed wind turbine control system p0127 A82-11859 Theoretical analysis of the performance of a gravity-controlled solar concentrator p0050 A82-12812 Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-12819 Oxide optimization at the p-Si/aqueous electrolyte p0052 A82-13199 Analysis of the optical characteristics of solar collectors p0052 A82-13715 Utility operating strategy and requirements for the wind power forecast
[AIAA PAPER 81-2539] p0127 A82-14007 Use of ceramics in point-focus solar receivers [AIAA PAPER 81-2552] p0054 A82-14015 Wind turbine assisted diesel generator systems [AIAA PAPER 81-2559] p0128 A82-14018 Wind energy for the Federal Republic of Germany p0130 A82-14358 Carbonate fuel cell power plant systems p0131 A82-15069
The electric utility 4.5 MW fuel cell power plant An urban demonstration p0131 A82-15070 Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0055 A82-15112 An analytical model for high-low-emitter /HLB/ solar cells in concentrated sunlight p0055 A82-15441 A pinhole model for metal-insulator-semiconductor solar cells D0056 A82-15442 Towards a high-temperature solar electric converter p0056 A82-15903 Grain size dependence of the photovoltaic properties of solar grade polysilicon p0057 A82-16051 High efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride p0058 A82-16127 K/u/-band flat-profile Si-IMPATT diodes with 10-percent efficiency p0058 A82-16132 n-/indium tin oxide//p-Inf solar cells p0058 A82-16471 Effects of dcuble-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 Optimization of heat losses in normal and reverse flat-plate collector configurations - Analysis and performance p0059 A82-16744 Turbines in the ocean p0132 A82-16844 Low cost silicon-on-ceramic photovoltaic solar cells p0059 A82-17098 Hydrogen from solar energy p0085 A82-17129 Finite Lambertian source analysis of concentrators - Application to solar reflectors p0060 A82-17294 Alcoa vertical axis wind turbines p0133 A82-17628 Application of large and small wind turbine generators - A utility perspective p0133 A82-17629 Wind energy conversion system design and analysis p0133 A82-17630

Overview of the Wind Energy Application Network

D0133 A82-17634

for Hawali

Analytical evaluation of the aerodynamic performance of a high-reliability vertical-axis wind turbine p0134 A82-17641 The El Paso electric 20-kilowatt photovoltaic system p0060 A82-17761 [AIAA PAPER 82-0064] The Mt. Laguna photovoltaic project
[AIAA PAPER 82-0065]
The Lea county electric 100-kilowatt p0061 A82-17762 grid-connected photovoltaic system
[AIAA PAPER 82-0067] p0061 A82-17764 MHD generator scaling analysis for baseload commercial power plants [AIAA PAPER 82-0394] p0135 A82-17922 A simplified model of the thermohydraulic behaviour of a linear collector network for the conversion of the solar energy p0062 A82-18816 Effect of positive pulse charge waveforms on the energy efficiency of lead-acid traction cells
[NASA-TM-82709] p0155 N82-10503
Evaluation of All-Day-Efficiency for selected flat plate and evacuated tube collectors [NASA-CR-161866] p0063 N82-10
Programmer's manual for the DOEHPE (DOE Heat Pump p0063 N82-10504 Efficiency) program [DE81-769452] p0007 N82-10551 Status of nickel/zinc and nickel/iron battery technology for electric vehicle applications [DE81-023572] p0157 N82 p0157 N82-10962 Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DE81-027234] p0068 N82-11557 Use of solar thermal energy to generate electricity [DB81-028797] p0070 N82-11606 Fuel nitrogen conversion during fuel rich combustion of pulverized coal and char p0105 N82-12156 Industrial application of fluidized-bed combustion [DE81-030272] p0105 N82-121 p0105 N82-12182 Intermediate photovoltaic system application experiment operational performance: Executive summary. Volume 1: For Newman Power Station, El Paso, Texas
[DE81-031934] p0072 N82-1 p0072 N82-12602 Innovative equipment for small-scale hydro developments [DE81-027820] p0141 N82-12634 Basis for research proposals concerning (industrial) solar energy production processes derived from biological principles p0075 N82-12640 Develop and test fuel cell powered on-site integrated total energy system. Phase 3: Full-scale power plant development [NASA-CR-165328] p0142 N82-13490 High resolution, low cost solar cell contact development [NASA-CR-165032] Intermediate photovoltaic system application experiment operational performance report. Volume 2 for Beverly High School, Beverly, Mass. [DE82-000811] p007 Data report for the northeast residential p0077 N82-13532 experiment station, June 1981 --- photovoltaic systems p0077 N82-13533 [DE82-000068] Electrical effects of slag in a diffuse mode magnetohydrodynamic generator p0143 N82-13550 Biomass energy utilization in the Pacific Northwest: Impacts associated with residential use of solid fuels p0115 N82-14383 [DE81-029137] Study of multi-megawatt technology needs for photovoltaic space power systems, volume 2 [NASA-CR-165323-VOL-2] p0078 N p0078 N82-14637 BHBRGY DISSIPATION Calculation of the top loss coefficient by the network method and applications to solar collectors p0056 A82-15653 Optimization of heat losses in normal and reverse flat-plate collector configurations - Analysis and performance D0059 A82-16744

ENERGY GAPS (SOLID STATE)
A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell
p0050 A82-12817 Preparation and properties of graded band gap
CdS/x/Te/1-x/ thin film sclar cells p0051 A82-12818
Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667
Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471
BRERGY METHODS
Coal-oil mixtures: An alternative fuel for the commercial markets and large residential markets
[DE81-028335] p0114 N82-14379 Role of large scale energy systems models in R6D
planning [DE81-026058] p0031 #82-15543
RHERGY POLICY Agricultural policies and biomass fuels
p0001 A82-11542
<pre>Bnergy future: Prophets, profits and policies; Proceedings of the Seventh Annual UMR-DNR</pre>
Conference on Energy, University of Missouri-Rolla, Rolla, MC, October 14-16, 1980.
Volume 7
p0002 A82-12547 Unconventional techniques of energy conversion
p0127 A82-13847 Analysis of electric utility investments into wind
power [AIAA PAPER 81-2537] p0003 A82-14006
Introduction of solar energy in Saudi Arabia - A
case study p0056 A82-15660
Energy for the year 2000 Book p0006 A82-18120
Development of organic geochemical and isotope techniques for hydrocarbon exploration
[BMFT-PB-T-80-076] p0097 N82-10482 Effect of positive pulse charge waveforms on the
energy efficiency of lead-acid traction cells
[NASA-TM-82709] p0155 N82-10503 Technological activities for high performance
receivers for solar thermal power plants [BMPT-FB-T-80-133] p0066 N82-10571
Methodology for determining the impact of environmental regulatory programs
[DE81-903429] p0009 N82-10594
Relaxing environmental standards during oil-supply disruptions: Past, present and future
[DE81-024250] p0009 N82-10601 Case studies in the application of air quality
modelling in environmental decision making: Summary and recommendations
[PB81-213233] p0009 N82-10605
Vertical combustor for refuse combustion [DB81-030002] p0098 N82-11152
Algorithm for computing in-situ combustion oil recovery performance
[DE81-030340] p0098 N82-11153 Investigation of mechanisms of hydrogen transfer
in coal hydrogenation [DE81-030492] p0099 M82-11165
Laboratory study for removal of organic sulfur
from coal [DE81-025132] p0010 N82-11239
Near-term goals for alcohol fuels from biomass: An overview of resource requirements, land use,
<pre>environmental, and socioeconomic impacts ethyl alcohol production</pre>
[DB81-029987] p0010 N82-11245
Assessment of oil-shale technology in Brazil [DE81-027574] p0010 N82-11249
Atmospheric fluidized-bed projects technology overview
[DE81-027143] p0102 B82-11251 Advanced-gasification processes
[DE81-030184] p0102 N82-11254 Transportation fuels from synthetic gas
[DE81-029614] p0102 N82-11258
Hydrogen storage-bed design for tritium systems test assembly
[DE81-025336] p0086 B82-11262 Possible use of coal in Hawari, 1980 - 2000
[DE81-028266] p0010 N82-11263 Alcohol fuels in the United States
[DE81-026013] p0010 H82-11265

```
LLNL underground coal gasification project
                                           p0103 N82-11267
  [DB81-030634]
Environmental research plan for gas supply technologies. Volume 2: Environmental research
  plan
  [PB81-222317]
                                           p0011 #82-11274
Ethanol production in southern tier east region of
  New York: Technical and economic feasibility
  [ PB81-226979]
                                           p0011 N82-11275
Synthetic fuel development for the Upper Missouri
  River Basin. Section 13: Water assessment report [PB81-224537] p0011 N82-11276
Low-cost solar flat-plate-collector development
  [DE81-025081]
                                           p0070 N82-11584
Modeling energy-conservation potentials of
  community energy-system technologies [DE81-026059] pc
                                           p0013 N82-11589
Interrelationships of energy and the economy: A supplement to the National Energy Policy Plan required by Title VIII of the US Department of
  Energy Organization Act (Public Law 95-91)
                                           p0013 N82-11613
  [DE81-027526]
SOLPLAN report: An assessment of barriers and
  incentives to conservation and
  alternative-energy use in the residential sector
  in Wisconsin
  [DOB/CS-30292/3]
An assessment of selected solar energy industry
  activities
  [ PB81-222424]
                                           p0071 N82-11623
Site selection for small wind energy conversion
  systems for US Department of Energy field
  evaluation program
  [PB81-226862]
The Rogers focusing heliostat experimental program
  at Rensselaer Polytechnic Institute
                                           p0071 N82-11625
  [PB81-226813]
US energy strategies: Some options for
  eliminating oil imports by the year 2000
  [PB81-226052]
                                           p0014 N82-11626
Environmental research plan for gas supply
technologies. Volume 1: Executive summary
  [PB81-222309]
                                           p0015 N82-11657
Coal combustion in high convective flows
                                           p0106 N82-12194
  [DE81-030391]
Catalytic hydrogenation of coal-derived liquids
[DE81-030485] p0106 N82-12198
Supercritical multicomponent solvent coal extraction
[NASA-CASE-NPO-15767-1] p0107 i
Selective separation of coal feedstocks for
                                           p0107 N82-12241
  conversion by magnetic separation techniques
[DE81-028060] p0108 N82-12263 Assessment of potential future markets for the
  production of hydrogen from water [BMFI-FB-T-81-012]
Performance of advanced chromium electrodes for
  the NASA Redox Energy Storage System
  [NASA-TM-82724]
                                           p0159 N82-12574
The severity of institutional barriers affecting
  energy-from-municipal-waste technologies [DE82-000133] p0018
                                           p0018 N82-12583
Bibliography of the seasonal thermal energy
  storage library
  [DE81-030470]
[DE81-030470] p0159 N82-12586 Utilization of waste heat from major transformer
  substations. Volume 1: Generic study
                                           p0019 N82-12593
  [DE81-904212]
Utilization of waste neat from major transformer
  substations. Volume 2: Site-specific study
  [DE81-904236]
                                           p0019 N82-12594
hpplication of different KFA-models in the framework of the energy research programme of
  the European Communities
                                           p0019 N82-12597
  [BOR-6758-BN]
Photovoltaic market analysis program:
                                            Background,
  model development, applications and extensions
  [DE81-029711]
                                           p0073 N82-12609
The properties of solar and heat pump heating systems of small houses and additional heat
  sources
  [ VTT-56 ]
                                           D0075 N82-12644
Energy technologies and the environment.
  Environmental information handbook
  [DE81-029809]
                                           p0020 N82-12660
Impact of fuel-economy shortfall: Trends in
  technology-weighted BPA versus on-road MPG.
  Periodic analysis memorandum no. 1 [DB81-030841]
                                           p0020 N82-12667
```

SUBJECT INDEX BEERGY STORAGE

Low-level radioactive waste: An introductory	Evaluating R and D options under uncertainty.
overview	Volume 3: An electric-utility
[DB81-026334] p0022 N82-12924	generation-expansion planning model
Power-plant fly-ash utilization: A	[DB81-904237] p0035 N82-16013
chemical-processing perspective	BEERGY REQUIREMENTS
[DB81-025452] p0022 N82-13191	Solar power satellite system energy balance
Barriers to the utilization of synthetic fuels for	p0050 A82-12509
transportation	Application of solar power satellites to India's
[NASA-CR-165517] p0023 N82-13243	energy needs - A macroengineering solution to a
Natural gas plan needed to provide greater	macroproblem
protection for high-priority and critical uses	p0062 A82-18645
[PB81-228488] p0023 N82-13255	Low-to-moderate temperature geothermal resource
Information resources in the USA on new and	assessment for Nevada, area specific studies
renewable energy, a description and directory	[DE81-030487] p0096 N82-10475
[DE81-028867] p0024 N82-13522	Energy end-use requirements in manufacturing,
Building a consensus about energy technologies	volume 1
[DE82-000501] p0024 N82-13536	[DE81-028975] p0064 N82-10512
Microemulsions, emulsions and related systems:	Energy expenditure and dietary change
Energy applications	
p0113 N82-13545	An optimization model for energy generation and
Sixth Underground Coal-Conversion Symposium	distribution in a dynamic facility
[DE81-027669] p0114 N82-14374	p0011 N82-11310
The nuclear controversy: Unequal competition in	Uncertainties associated with inertial-fusion
public policy-making	ignition
[BRG-035] p0027 N82-14626	[DE81-025408] p0139 N82-11944
Need for power and the choice of technologies:	Comparison of residential window distributions and
State decisions on electric power faculities	effects of mass and insulation
[DE81-025960] p0027 N82-14644	[DE81-027938] p0017 N82-12283
Projecting regional potentials for cost-effective	Models for forecasting energy use in the US farm
energy conservation and renewable resource	sector
applications: A feasibility study	[DE81-904220] p0018 N82-12580
[DOB/CS-10045/I3] p0027 N82+14645	Performance analysis of 11 Denver Metro passive
Analysis of potential cogeneration impacts on	hones
electricity generation by the Central Maine	[DB81-025473] p0074 N82-12626
Power Company	Technology characterizations: Environmental
[DE81-029991] p0028 N82-14650	information handbook, second edition
Analysis of the energy impacts of the DOE	[DE81-029993] p0021 N82-12671
Appropriate Energy Technology Small Grants	Need for power and the choice of technologies:
Program: Method and results	State decisions on electric power facilities
[DE81-029844] p0028 N82-14651	[DB81-025960] p0027 N82-14644
International energy indicators	Energy and development in Central America. Volume
[DE81-028117] p0028 N82-14653	1: Regional assessment
Seminars for private college administrators on	[PB81-231540] p0032 N82-15589
solar applications for college buildings	Energy and development in Central America. Volume
[DB81-027981] p0079 N82-14661	2: Country assessments
Potential energy savings in the residential sector	[PB81-231557] p0032 N82-15590
of the United States	RHERGY SOURCES
[DE81-028873] p0028 N82-14662	Photovoltaic system studies and developments
Millions wasted trying to develor major energy	p0049 A82-11804
	Energy technology VII: Expanding supplies and
information system	
[AFMD-81-40] p0029 N82-14959	conservation; Proceedings of the Seventh
High efficient collector for small solar-powered	Conference, Washington, DC, March 24-26, 1980
facilities	p0004 A82-14924
[BMFT-FB-T-81-156] p0080 N82-15538	Alcohol fuels bibliography, 1901 - March 1980
Role of large scale energy systems models in R&D	[DE81-025482] p0095 N82-10263
planning	Solar photovoltaic system engineering perspectives
[DE81-026058] p0031 N82-15543	[DE81-023179] p0066 N82-10570
Low-cost passive-solar retrofits for new and	Gas recovery from coal deposits ,
existing mobile homes	[PB81-222291] p0103 N82-11271
[DE81-028356] p0081 N82-15544	Analysis report: Applied analysis model summaries
Annual report to the President and the Congress on	[DE81-029278] p0018 N82-12526
the State Energy Conservation Program for	Energy and development in Central America. Volume
calendar year 1980	1: Regional assessment
	[PB81-231540] p0032 N82-15589
[DE81-025862] p0031 N82-15554	
Technology change and energy consumption: A	Energy and development in Central America. Volume
comparison of residential subdivisions	2: Country assessments
[DE81-030075] p0031 N82-15555	[PB81-231557] p0032 N82-15590
SBRI Solar-Energy-Storage Program	ENERGY STORAGE
[DE81-029476] p0082 N82-15576	An experimental study of SO3 dissociation as a
Energy consumption analysis and comparative study	mechanism for converting and transporting solar
of the operational results from heat pump plants	energy
[BMFT-FB-T-80-109] p0032 N82-15583	p0043 A82-11214
Indian energy abstracts	Development status of a regenerative fuel cell
[PB81-232316] p0032 N82-15591	system for orbital operation
	p0153 A82-11707
Heavy-duty engine taseline program and NO sub x	Techniques and applications of pulsed power
emission standard development (1972-73)	, - ,
[PB81-244030] p0034 N82-15621	technology
Proceedings: Symposium on Flue Gas	p0153 A82-11722
Desulfurization, volume 2	The Texas Instruments Solar Energy System
[PB81-243164] p0035 N82-15652	development
Methodology and basic algorithms of the Livermore	p0047 A82-11773
Economic Modeling Systems	Design considerations for a 1500 M head 300-600 MW
[DE81-029430] p0035 N82-15833	double stage reversible pump/turbine with
Evaluating R and D options under uncertainty.	regulation
Volume 2: Atmospheric fluidized-bed combustion	p0154 A82-11782
commercialization strategies	Lightweight hydrides for automotive storage of
	planetaur thantags for agromoring prorade or
[DE81-904246] p0035 N82-16012	UANTONEN
2	p0084 A82-11790

Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Planning an underground pumped hydro project for appendix C. Major mechanical equipment the Commonwealth Edison Company p0158 N82-11621 [DE81-030672] p0154 A82-11847 Assessment of flywheel system benefits in selected vehicle applications [DB81-025976] Mechanically stable hydride composites designed p0158 N82-11997 for rapid cycling p0084 A82-16347 Metal hydrides 1980; Proceedings of the International Symposium Study of ATES thermal behavior using a steady flow model [DE81-030883] p0159 N82-12396 Applications of Metal Hydrides, Colorado Springs, CO, April 7-11, 1980. Volumes 1 & 2 Performance of advanced chromium electrodes for the NASA Redox Energy Storage System p0085 A82-16784 p0159 N82-12574 [NASA-TH-82724] Rechargeable metallic hydrides for hydrogen storage Bibliography of the seasonal thermal energy storage library p0085 A82-17150 [DE81-030470] A photovoltaic system with energy storage -Security assessment of power systems including energy storage and with the integration of wind Natural Bridges Naticnal Monument 100-kW system
[AIAA PAPER 82-0066] p0155 A82-17763 [AIAA PAPER 82-0066] Configuration selection study for isclated loads using parabolic dish modules
[AIAA PAPER 81-2549] p0061 AF
Fundamental investigations on fuel cells for p0140 B82-12590 [DE81-030166] Comparative economic performance of selected passive solar heating and cooling technologies p0061 A82-18223 transportation applications [DE81-0302201 p0072 N82-12600 A preliminary estimate of future communications traffic for the electric power system p0137 N82-10493 Mechanical energy storage technology project Mechanical energy processed processed air energy storage in hard rock. Volume 1: Executive summary points 882-10 p0024 N82-13493 p0155 882-10508 [NASA-CR-165015] Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 p0155 N82-10527 A central microprocessor controlled electrical Preliminary design study of underground pumped hydro and compressed-air energy storage in hard storage heating system [BMFT-FB-T-80-182] p0025 N82-13547 Design of an energy conservation building [NASA-TM-83175] p002 Volume 2: Project design criteria: rock. p0156 N82-10528 [DB81-028107] p0027 N82-14632 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard Flywheel rotor and containment technology development Volume 5: Site selection [DE81-028047] p0159 N82-14655 [DE81-028199] p0156 N82-10529 Reservoir stability studies Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches, CAES. [DE81-030099] p0160 N82-15510 Compressed-air energy-storage technology: Program overview Appendix D: Mechanical systems [DE81-030103] p0160 N82-15548 [DB81-028200] p0156 N82-10530 Supplement to energy for rural development: Status of the DOE battery and electrochemical Renewable resources and alternative technologies technology program 2 [DB81-029879] for developing countries [PB81-231011] p0156 N82-10540 p0032 N82-15592 Solar energy system design: A simple method for sizing the collector field and thermal storage ENERGY TECHNOLOGY Solar materials science --- Book [DE81-028852] p0065 N82-10541 p0037 A82-10007 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard Introduction to photovoltaics - Physics, materials and technology rock. Volume 3: Project design criteria: CAES [DE81-028197] p0156 N82-105 P0038 A82-10022 [DE81-028197] p0156 N82-10546 Rapid charging of lead-acid latteries for electric-vehicle propulsion and solar-electric Research and device problems in photovoltaics p0039 A82-10023 Some characteristics of silicon photocells fabricated by planar technology [DE81-028084] p0157 N82-10548 p0039 A82-10386 Annual cycle energy system [DE81-024911] Waves of energy p0007 N82-10552 D0121 A82-10450 Near-term batteries for electric vehicles The development and design of steam/water solar p0157 N82-10556 [DE81-023543] receivers for commercial application Testing and evaluation of a solar photovoltaic [ASME PAPER 81-SOL-4] p0042 A82-10972 flywheel energy storage system
[DOE/ET-20279/130] p0065 N82-105
Preliminary design study of underground pumped
hydro and compressed-air energy storage in hard
rock. Volume 12: Plant design, CAES Annual review of energy. Volume 6 --- Book p0065 N82-10558 p0001 A82-11540 Solar energy technology - A five-year update p0044 A82-11541 Intersociety Energy Conversion Engineering Conference, 16th, Atlanta, GA, August 9-14, 1981, Proceedings. Volumes 1, 2 & 3 p0157 N82-10574 [DE81-028110] Design considerations for vehicular fuel cell power plants
[DE81-769737] p0121 A82-11701 p0138 N82-10961 Effect of depth of discharge on cycle life of Hydrogen storage-bed design for tritium systems near-term batteries test assembly [DE81-025336] p0086 N82-11262 Advances in space power research and technology at Energy programs at the johns hopkins university the National Aeronautics and Space Administration Applied Physics Laboratory
[PB81-218141] p0013 N82Recent advances in lead-acid cell research and p0122 A82-11755 p0013 N82-11535 Nuclear electric power for space systems -Technology background and flight systems program
p0123 A82-11756
Recent progress on the development of the Dow development [DE81-023104] p0158 N82-11580 Mechanical Energy Storage Technology (MEST) hollow fiber sodium-sulfur battery development p0123 A82-11777 [DE81-026800] p0158 N82-11596 Molten salt thermal energy storage subsystem for Preliminary design study of underground pumped hydro and compressed-air energy storage in hard Solar Thermal Central Receiver plants p0047 A82-11780 Volume 8: Design approaches: UPH Modelling of the jet-stream Fluidyne [DE81-030673] p0158 B82-11620 p0124 A82-11812

Applications of thermoelectrics to geothermal energy conversion	International Symposium on Wave and Tidal Energy, 2nd, St. John's College, Cambridge, England,
p0125 A82-11824 Design considerations for small wind energy	September 23-25, 1981, Proceedings p0135 A82-18124
conversion and storage systems	High performance solar Stirling system
p0126 A82-11831	[AIAA PAPER 81-2554] p0061 A82-18222
Regenerative pyroelectric heat engine	Liquid fossil fuel technology
p0126 A82-11833 Enthanol fuels from bicmass projects	[DE81-029912] p0094 N82-10250 Tertiary oil recovery processes research at the
p0089 A82-11837	University of Texas
Production of synthetic crude oil from coal using	[DE81-025222] p0096 N82-10477
the TOSCOAL pyrolysis process	Development of man-made geothermal reservoirs
p0090 A82-11849	extracting heat from hot dry rock
Brayton cycle using dissociating nitrosyl chloride p0126 A82-11852	[LA-UR-81-852] p0097 N82-10480 Cooperative program of applied energy research
Advances in coal fired MHD generator research	technology development
p0126 A82-11853	[DE81-028916] p0007 N82-10517
Status report on MBD generator materials p0126 A82-11854	Solar energy system design: A simple method for sizing the collector field and thermal storage
Geothermal systems: Principles and case histories	[DB81-028852] p0065 882-10541
Book	Hot dry rock geothermal energy development program
p0090 A82-12275 Energy from biomass and wastes V; Proceedings of	[LA-UR-81-1265] p0097 N82-10560
the Fifth Symposium, Lake Buena Vista, FL,	Water-related constraints to the development of geothermal electric generating stations
January 26-30, 1981	[DE81-025138] p0007 N82-10561
p0090 A82-12400	Electrochemical photovoltaic cells
U.S. Department of Energy liquid synfuels overview p0090 A82-12531	[DE81-769704] p0066 N82-10568 Analysis of data from the US Department of
Energy future: Prophets, profits and policies;	Energy's meteorological validation program
Proceedings of the Seventh Annual UMR-DNR	[DE81-030100] p0097 N82-10655
Conference on Energy, University of Missouri-Rolla, Bolla, MO, October 14-16, 1980.	Key contributions in MHD power generation
Volume 7	[DE81-028121] p0138 N82-10882 Solar data base management system
p0002 A82+12547	[DE81-023122] p0066 N82-10952
Unconventional techniques of energy conversion	Ames Laboratory research report, 1980
p0127 A82-13847 Dish concentrators for solar thermal energy -	[DE81-027399] p0161 N82-11012 Yawing of wind turbines with blade cyclic pitch
Status and technology development	variation
[AIAA PAPER 81-2530] p0053 A82-14001	[DE81-030091] p0138 N82-11045
Feasibility of solar assisted ethanol production [AIAA PAPEE 81-2533] p0054 A82-14004	Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255
Proposed 12.5 MWe shelf-mounted OTEC pilot plant	Chemical heat pump program: An overview
for power, water and mariculture at St. Croix	[DE81-025086] p0012 N82-11414
[AIAA PAPEE 81-2546] p0127 A82-14011 Renewables in the U.S. energy future - How much,	Energy programs at the johns hopkins university Applied Physics Laboratory
how fast	[PB81-218141] p0013 N82-11535
p0003 A82-14404	Heat storage duration
Contributions of space reflector technology to food production, local weather manipulation and	[DE81-026635] p0070 N82-11602 An assessment of selected solar energy industry
energy suprly, 1985-2020	activities
energy suprly, 1985-2020 p0054 A82-14445	activities [FB81-222424] p0071 N82-11623
p0054 A82-14445 A technological approach towards future large	[PB81-222424] p0071 N82-11623 Intergrated assessment for energy-related
p0054 A82-14445 A technological approach towards future large solar arrays	[PB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980	[PB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy,
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Sventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Fuel and energy Book	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Several Conference, Washington, EC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, PC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects p0131 A82-15667	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Fuel and energy Book North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 EW receiver for	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Plorida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Fuel and energy Book North American tidal power prospects The design of a sodium-cocled 2.7 NW receiver for a solar power plant	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Plorida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Fuel and energy Book North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 EW receiver for	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 HW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental
P0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, PC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 MW receiver for a solar power plant p0059 A82-17126 Bechargeable metallic hydrides for hydrogen storage	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Plorida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation: Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects p0004 A82-15589 North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 MW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] p0021 N82-12671 Alternate hybrid power sources for remote site
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 MW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films p0060 A82-17255 American Wind Energy Association, National	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-025048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] Alternate hybrid power sources for remote site applications
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 P0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects The design of a sodium-cocled 2.7 HW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films p0060 A82-17255 American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980,	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] p0021 N82-12671 Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation: Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Fuel and energy Book North American tidal power prospects p0004 A82-15589 North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 MW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films p0060 A82-17255 American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] p0021 N82-12671 Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 Information resources in the USA on new and renewable energy, a description and directory
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation: Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 Research opportunities in new energy-related materials p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects The design of a sodium-cocled 2.7 NW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings p0132 A82-17626 SWECS technology - State-of-the-art and achievable	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-025048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] New Pool of the Control of the Cont
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects The design of a sodium-cocled 2.7 HW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings SWECS technology - State-of-the-art and achievable goals Small Wind Energy Conversion Systems	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] p0021 N82-12671 Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 Information resources in the USA on new and renewable energy, a description and directory [DE81-028867] p0024 N82-13522 Microemulsions, emulsions and related systems:
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation: Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Fuel and energy Book North American tidal power prospects p0131 A82-155667 The design of a sodium-cocled 2.7 MW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films p0600 A82-17255 American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings p0132 A82-17626 SWECS technology - State-of-the-art and achievable goals Small Wind Energy Conversion Systems p0134 A82-17644 Energy for the year 2000 Book	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 Information resources in the USA on new and renewable energy, a description and directory [DE81-028867] p0024 N82-13522 Microemulsions, emulsions and related systems: Energy applications
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation; Proceedings of the Seventh Conference, Washington, EC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 MW receiver for a solar power plant p0059 A82-17126 Bechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films p0060 A82-17255 American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings p0132 A82-17626 SWECS technology - State-of-the-art and achievable goals Small Wind Energy Conversion Systems p0134 A82-17644	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] p0021 N82-12671 Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 Information resources in the USA on new and renewable energy, a description and directory [DE81-028867] p0024 N82-13522 Microemulsions, emulsions and related systems: Energy applications
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation: Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects p0131 A82-15589 North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 MW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films p0600 A82-17255 American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings p0132 A82-17626 SWECS technology - State-of-the-art and achievable goals Small Wind Energy Conversion Systems p0134 A82-17644 Energy for the year 2000 Book	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] p0021 N82-12671 Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 Information resources in the USA on new and renewable energy, a description and directory [DE81-028867] p0024 N82-13522 Microemulsions, emulsions and related systems: Energy applications [DE81-026088] p0113 N82-13545 Health and safety research division p0026 N82-13652
p0054 A82-14445 A technological approach towards future large solar arrays p0055 A82-14446 Energy technology VII: Expanding supplies and conservation: Proceedings of the Seventh Conference, Washington, DC, March 24-26, 1980 p0004 A82-14924 Energy technology VIII: New fuels era; Proceedings of the Eighth Conference, Washington, DC, March 9-11, 1981 p0004 A82-14925 Research opportunities in new energy-related materials p0161 A82-15377 Puel and energy Book North American tidal power prospects p0131 A82-15589 North American tidal power prospects p0131 A82-15667 The design of a sodium-cocled 2.7 MW receiver for a solar power plant p0059 A82-17126 Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150 Oxidation of electrodeposited black chrome selective solar absorber films p0600 A82-17255 American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings p0132 A82-17626 SWECS technology - State-of-the-art and achievable goals Small Wind Energy Conversion Systems p0134 A82-17644 Energy for the year 2000 Book	[FB81-222424] p0071 N82-11623 Intergrated assessment for energy-related environmental standards: A summary of issues and findings [DE81-028552] p0014 N82-11646 Department of Energy projects [DE82-000038] p0018 N82-12579 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 Status of solar energy research and development in Australia [NP-1903916] p0073 N82-12611 Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1 [DE82-000808] p0019 N82-12613 Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 Modelling energy-economic interactions in developing countries: A linear-programming approach [DE81-026048] p0020 N82-12637 Technology characterizations: Environmental information handbook, second edition [DE81-029993] p0021 N82-12671 Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 Information resources in the USA on new and renewable energy, a description and directory [DE81-028867] p0024 N82-13522 Microemulsions, emulsions and related systems: Energy applications

Pulsed Power Research colloguium [AD-A105770] p0150 N82-14638	Conceptual design of a large coal-fired stationary Stirling engine
Need for power and the choice of technologies:	p0123 A82-11806
State decisions on electric power facilities	Conceptual design of 500 to 3000 hp Stirling
[DE81-025960] p0027 N82-14644	engines for stationary power generation
<pre>Pire-protection research for energy technology: Py 80 year end report</pre>	p0123 A82-11807 Development free-piston Stirling test-bed engine
[DB82-000970] p0161 N82-14649	p0123 A82-11808
Analysis of the energy impacts of the DOB	Regenerative pyroelectric heat engine
Appropriate Energy Technology Small Grants Program: Method and results	p0126 A82-11833 On the efficiency of thermal engines with power
[DE81-029844] p0028 N82-14651	output - Harmonically driven engines
Plywheel rotor and containment technology	p0131 A82-14489
development	Ceramics for the AGT101 automotive gas turbine
[DE81-028047] p0159 N82-14655 Energy recovery from municipal waste development	p0132 A82-16827 A computer model of a stirling engine using a
program for Idaho Palls, Idaho	two-phase two-component working fluid
[DE81-029999] p0028 N82-14659	p0137 N82-10492
Seminars for private college administrators on solar applications for college buildings	Test results and facility description for a 40-kilowatt stirling engine
[DE81-027981] p0079 N82-14661	[HASA-TH-82620] p0141 N82-13013
Value tree analysis of energy supply alternatives	Augmentation of research and analysis capabilities
[AD-A105629] p0029 N82-14875	for timely support of automotive fuel economy
Millions wasted trying to develop major energy information system	activities. Volume 1: Summary [PB81-219479] p0022 N82-13018
[APMD-81-40] p0029 N82-14959	Augmentation of research and analysis capabilities
An assessment of nonfossil hydrogen	for timely support of automotive fuel economy
[PB81-246522] p0087 M82-15231 Hydrogen as carrier of secondary energy: Proposal	activities. Volume 2: Appendices A through C [PB81-219487] p0022 N82-13019
for a research and development program	Augmentation of research and analysis capabilities
[DPVLR-MITT-81-10] p0087 N82-15542	for timely support of automotive fuel economy
Role of large scale energy systems models in R&D planning	activities. Volume 3: Appendix D [PB81-219495] p0022 N82-13020
[DE81-026058] p0031 N82-15543	ENGINE PARTS
Solar energy training program for code enforcement	Conceptual design of 500 to 3000 hp Stirling
personnel	engines for stationary power generation p0123 A82-11807
Annual DOE Active Solar Heating and Cooling	Baseline data on utilization of low-grade fuels in
Contractors Review meeting	gas turbine applications. Volume 2: Hot
[DE81-028052] p0081 M82-15572 Verification of BLAST by comparison with	component corrosion evaluation [DE81-903760] p0094 N82-10253
measurements of a solar-dominated test cell and	RNGINE TESTS
a thermally massive building	Liquid hydrogen for automotive vehicles -
[DE81-029883] p0082 N82-15578 Indian energy abstracts	Experimental results [ASME PAPER 81-HT-83] p0083 A82-10968
[PB81-232316] p0032 N82-15591	Evaluation of shale oil as a utility gas-turbine
Supplement to energy for rural development: Benewable resources and alternative technologies	fuel
for developing countries	[DE81-904234] p0107 N82+12251 ENGINEERING MANAGEMENT
[PB81-231011] p0032 N82-15592	Macro-engineering: The rich potential; Proceedings
Methodology and basic algorithms of the Livermore Economic Modeling Systems	of the Third Symposium, San Prancisco, CA, January 6, 1980
[DE81-029430] p0035 N82-15833	p0006 A82-18643
Application of an LP model to strategic planning	BNGINES
of multinational cooperative RD and D programs [DE81-029325] p0035 N82-16014	Evaluation of shale oil as a utility gas-turbine fuel
EMERGY TRANSPER	[DE81-904234] p0107 N82-12251
An experimental study of SO3 dissociation as a	BUTHALPY
mechanism for converting and transporting solar energy	Enthalpy measurement of coal-derived liquids [DE81-029481] p0097 N82-10939
p0043 A82-11214	ENVIRONMENT EFFECTS
Energy transfer in wind-assist electric power	Environmental factors of power satellites
systems p0130 A82-14359	p0002 A82-12505 Aspects concerning the safety of hydrogen
Review of simulation techniques for Aquifer	p0085 A82-17132
Thermal Energy Storage (ATES)	Methodology for determining the impact of
[DE81-029943] p0156 #82-10532 Environmental impacts of energy transportation	environmental regulatory programs [DE81-903429] p0009 N82-10594
[DE82-900316] p0025 N82-13559	Bconomic and environmental tradeoffs in coal
BNGING CONTROL	CONVERSION -0000 POR 10500
A study of factors influencing thermally induced backfiring in hydrogen fueled engines, and	[CONF-800608-8] p0009 N82-10598 Coal fly ash: A review of the literature and
methods for backfire control	proposed classification system with emphasis on
p0084 A82-11791	environmental impacts [PB81-215014] p0009 N82-10608
The role of avionics in the all electric airplane [AIAA 81-2219] p0002 A82-13457	[PB81-215014] p0009 N82-10608 Near-term goals for alcohol fuels from biomass:
ENGINE DESIGN	An overview of resource requirements, land use,
Liquid hydrogen for automotive vehicles - Bxperimental results	environmental, and socioeconomic impacts ethyl alcohol production
[ASHE PAPER 81-HT-83] p0083 A82-10968	[DE81-029987] p0010 882-11245
The AGT101 technology - An automotive alternative	Assessment of oil-shale technology in Brazil
p0123 A82-11783 Development of a solar receiver for an organic	[DE81-027574] p0010 M82-11249 Advanced-gasification processes
Rankine cycle engine	[DE81-030184] p0102 H82-11254
p0048 A82-11800	Environmental research plan for gas supply
Overview of DOE's large stationary Stirling engine development program	technologies. Volume 2: Environmental research plan
p0123 A82-11805	[PB81-222317] p0011 882-11274

SUBJECT INDEX ENVIRONMENTAL QUALITY

Technology characterizations: Environmental information handbook, second edition Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. [DE81-029993] p0021 N82-12671 ENVIRONMENT MODELS Research requirements. 3. High priority programs [DE81-904014] p0104 N82-11520 Case studies in the application of air quality p0104 N82-11520 modelling in environmental decision making: Summary and recommendations [PB81-213233] p0009 N8 Great Plains gasification project, Mercer County, North Dakota: water assessment report section D0009 N82-10605 13 (c) BUVIRONMENT POLLUTION [PB81-216111] Oil and gas industry and environmental pollution: Great Plains gasification project, Mercer County, Application of systems reliability analysis for North Dakota; water assessment report [PB81-216129] po the evaluation of the status of environmental pollution control in the Nigerian petroleum p0013 N82-11525 Solid and hazardous energy wastes: Synfuels. 1: industry Review of research activities p0008 N82-10583 Environmental assessment of the Alaskan
Continental Shelf: Annual reports of principal
investigators for the year ending March 1980. [DE81-028503] p0014 N82-11644 Environmental research plan for gas supply technologies. Volume 1: Executive summary Volume 5: Hazards [PB81-222309] p0015 N82-11657 [PB81-225732] p0026 N82-13607 Potential environmental problems of enhanced oil Computer models to support investigations of surface subsidence and associated ground motion induced by underground ccal gasification and gas recovery techniques [DE81-027131] p0015 N82-11712
National coal-market conditions for the year 2000:
Regional-issue identification and analysis, high [PB81-240186] p0034 N82-15637 BRVIRGHMENT PROTECTION The electric utility 4.5 MW fuel cell power plant - An urban demonstration scenario [DE81-026425] p0016 N82-11988 p0131 A82-15070 Assessment of the potential of coal-fueled heat Relaxing environmental standards during oil-supply disruptions: Past, present and future [DE81-024250] p00 engines in total and integrated energy systems [DE82-000169] p0018 N82-12587 p0009 N82-10601 Modular hydro dam approach to the economic development of ultra low-head hydropower Intergrated assessment for energy-related environmental standards: A summary of issues p0019 N82-12635
Development of testing procedures and
bibliographic information relevant to the
testing of solid wastes resulting [DE81-027817] and findings [DE81-028552] p0014 N82-11646 Peasibility analysis of trench strip and auger mining
[DE81-027557]

Application of different KFA-models in the
framework of the energy research programme of
the European Communities fuels production
[DB81-030822] p0020 N6
Technology characterizations: Environmental
information handbook, second edition p0017 N82-12521 p0020 N82-12661 p0021 N82-12671 [EUR-6758-EN] [DE81-029993] Overview of the biomedical and environmental Environmental readiness document. Advanced Isotope Separation Program [DE81-029952]
ENVIRONMENTAL CONTROL programs at the Oak Ridge National Laboratory [DE81-027864] p0021 N82-[DE81-027864] p0021 N82-12765
Environmental and economic comparison of advanced D0029 N82-14900 processes for conversion of coal and Diomass Blectric and hybrid vehicles environmental control into clean energy subsystem study [FB81-234239] p0023 N82-13256 Residual-energy-applications program environmental analysis report --- induced [NASA-CR-164995] p0020 N82-12657 Electric and hybrid vehicle environmental control analysis report --- industrial scale waste heat subsystem study recovery equipment and utilization [DE81-027538] [NASA-CR-164996] p0020 N82-12658 p0024 N82-13525 ENVIRONMENTAL ENGINEERING Technology assessment of solar energy systems: Availability and impacts of woody biomass Macro-engineering: The rich potential; Proceedings of the Third Symposium, San Francisco, CA, utilization in the Pacific Northwest January 6, 1980 [DE82-000705] p0024 N82-13535 Compressed air energy storage: Preliminary design and site development program in an aquifer. D0006 A82-18643 ENVIRONMENTAL MONITORING INEL goethermal environmental program p0008 N82-10591 Volume 2: Utility system planning [DE81-025671] p0159 N82-13544 [DE82-000466] Coal gasifier parameters influencing environmental Environmental impacts of energy transportation pollutant production FB81-221301] [DE82-900316] p0011 N82-11273 p0025 N82-13559 Environmental hazard rankings of pollutants Environmental data for sites in the National Solar generated in coal gasification processes Data Network [PB81-231698] [DE82-000071] p0075 N82-12707 p0026 N82-13576 Environmental assessment of the Alaskan Offshore petroleum industry environmental data Continental Shelf: Annual reports of principal investigators for the year ending Barch 1980. requirements: Emphasis on remote sensing p0027 N82-14557 Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] p0030 N82-1548 Volume 5: Hazards [PB81-225732] p0026 N82-13607 p0030 N82-15488 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 BNVIRONMENTAL QUALITY Pollution of the soil by aviation gasoline [PML-1979-41] p0032 Environmental compliance program handbook p0032 N82-15596 p0008 N82-10585 [DE81-030226] Case studies in the application of air quality Ecological effects assessment: Requirements vs state-of-the-art modelling in environmental decision making: Summary and recommendations [PB81-213233] [DE81-028092] [DE81-028092] p0032 N82-15598 Symposium proceedings: Environmental aspects of fuel conversion technology, 5th Environmental and radiological safety studies: [PB81-245045] p0034 N82-15623 Interaction of (238) PuO2 heat sources with Potential environmental problems of enhanced oil terrestrial and aquatic environments [DE81-032019] p0025 N82-13565 Potential environmental problems of enhanced oil [DE81-032019] and gas recovery techniques [PB81-240186] p0034 N82-15637 and gas recovery techniques [PB81-240186] ENVIRONMENT MANAGEMENT Energy technologies and the environment. p0034 N82-15637 Environmental information handbook

p0020 N82-12660

FDE81-0298091

ENVIRONMENTAL SURVEYS SUBJECT INDEX

BHVIRONMENTAL SURVEYS	EUROPEAB SPACE AGENCY
Solvent-Refined Coal-1 Demonstration Project.	Economic effects induced by ESA contracts, phase
Final environmental impact statement, Volume 1	2. Volume 1: Summary
of 2 coal liquefaction plant at Newman,	[ESA-CR(P)-1462-VOL-1] p0161 N82-14981
Kentucky [DE61-025983] p0010 N82-11252	EVAPORATION Evaporative hydrocarbon emissions from a large
[DE61-025983] p0010 N82-11252 ENXING ACTIVITY	vehicle population
Partial acid hydrolysis pretreatment for enzymatic	p0004 A82-14442
hydrolysis of cellulose: A process development	BVAPORATION RATE
study of ethanol production	Effect of wick dryness on the performance of heat
p0107 N82-12236	pipes with separate channels
EPITAXY	p0005 A82-16272 EVAPORATORS
Efficient Si solar cells by low-temperature solid-phase epitaxy	Measured performance of falling-jet flash
p0043 A82-11344	evaporators
Production and certain properties of photoelectric	[DE81-024355] p0161 882-10565
cells based on silicon epitaxial structures	High efficient collector for small solar-powered
p0053 A82-13716	facilities
Effects of heat treatment on epitaxial silicon	[BMFT-FB-T-81-156] p0080 N82-15538 EXCAVATION
solar cells on metallurgical siliccn substrates p0058 A82-16469	Longwall mining of thin seams
EQUATIONS OF MOTION	[DE81-028042] p0116 N82-14612
An aeroelastic analysis of the Darrieus wind turbine	BXHAUST BHISSION
[AIAA PAPER 81-2572] p0129 A82-14029	Evaporative hydrocarbon emissions from a large
Analytical solution of a simulation model for wind	vehicle population
turbines	p0004 A82-14442
p0132 A82-16600 EQUATIONS OF STATE	Dimethyl sulfate in particulate matter from coal- and oil-fired power plants
Development of a thermodynamic properties	p0005 A82-16199
correlation framework for the coal conversion	Soot formation in synthetic fuel droplets
industry, phase 1A	[DE81-028391] p0092 N82-10150
[DE81-030363] p0111 N82-12985	Baseline data on utilization of low-grade fuels in
EQUIVALENT CIRCUITS	gas turbine applications. Volume 3: Emissions
A practical method of analysis of the	evaluation [DE81-903764] p0006 N82-10254
current-voltage characteristics of solar cells p0051 A82-12823	[DE81-903764] p0006 N82-10254 Informational report on the measurement and
RROSIVE BURNING	characterization of diesel exhaust emissions
Real time coarse particle mass measurements in a	[PB81-221251] p0009 N82-11175
high temperature and pressure coal gasifier	Low-Btu-gasifier emissions toxicology
process treatment	[DE81-031000] p0014 N82-11651
[DE81-030036] p0033 N82-15609	FGDIS primer: Major equipment/component classifications, problem/solution access codes,
ESTINATES Venezuela, Trinidad and Tobago: Crude oil	and definitions related to PGD systems as
potential from known degosits	contained in the Flue Gas Desulfurization
[DE81-027023] p0096 N82-10474	Information System (FGDIS)
RTCHING	[PB81-225948] p0016 N82-11985
Sputter etched metal solar selective absorbing	Evaluation of the micro-carburetor
surfaces for high temperature thermal collectors	[NASA-CR-164958] p0016 N82-11994
p0057 A82-16057 ETHYL ALCOHOL	AGT-102 automotive gas turbine [NASA-CR-165353] p0140 N82-12444
Enthanol fuels from bicmass projects	Control of hydrocarbons and carbon monoxide via
p0089 A82-11837	catalytic incineration
Feasibility of solar assisted ethancl production	[DE82-000508] p0025 N82-13560
[AIAA PAPER 81-2533] p0054 A82-14004	Characterization of diesel emissions as a function
Near-term goals for alcohol fuels from biomass:	of fuel variables
An overview of resource requirements, land use, environmental, and socioeconomic impacts	[PB81-244048] p0118 N82-15233 Heavy-duty engine baseline program and NO sub x
ethyl alcohol production	'emission standard development (1972-73)
[DE81-029987] p0010 N82-11245	[PB81-244030] p0034 N82-15621
Ethanol production in southern tier east region of	EXHAUST GASES
New York: Technical and economic feasibility	Cyclone performance estimates for pressurized
[PB81-226979] p0011 N82-11275	fluidized-bed combustion combined cycle
Partial acid hydrolysis pretreatment for enzymatic hydrolysis of cellulose: A process development	power generation [DE81-028504] p0093 N82-10156
study of ethanol production	EPA utility FGD (Plue Gas Desulfurization) survey
p0107 N82-12236	[PB81-225773] p0015 N82-11679
Project for reliability fleet testing of	Selected studies of four high-temperature
alcohol/gasoline blends	air-pollution sources
[DE82-000004] p0107 N82-12250	p0015 N82-11680
Peasibility study report for the Imperial Valley	Evaluation of shale oil as a utility gas-turbine
Ethanol Refinery: A 14.9-million-gallon-per-year ethanol synfuel	fuel [DE81-904234] p0107 N82-12251
refinery utilizing quothermal energy	Control of hydrocarbons and carbon monoxide via
[DE82-000288] p0112 N82-13252	catalytic incineration
Alcohol fuels grant program at Lincoln Land	[DE82-000508] p0025 N82-13560
Community College, Springfield, Illinois	Heavy-duty engine baseline program and NO sub x
[DE82-000744] p0114 N82-14375	emission standard development (1972-73)
Feasibility study for an alcohol-fuels plant for Buffalo, New York	[PB81-244030] p0034 N82-15621 Proceedings: Symposium on Flue Gas
[DE82-00032] p0114 N82-14377	Desulfurization, volume 1
The utilisation of alcohol in light duty diesel	[PB81-243156] p0035 N82-15651
engines	EXHAUST SYSTEMS
[PB81-244469] p0118 N82-15452	Demonstration of Wellman-Lord/Allied Chemical FGD
EUROPE Goomagnetic and magnetotelluric soundings in the	technology: Demontration test second year results [PB81-246316] p0034 N82-15626
Geomagnetic and magnetotelluric soundings in the area of the Central European rift system	EXPANSION P0034 882-13826
[BMPT-FB-T-81-111] p0119 N82-15656	Design and development of a reciprocating
	low-temperature freon expander
	[DE81-028609] p0023 N82-13392

EXPERIMENTAL DESIGN LLNL underground coal gasification project	PATTY ACIDS A protective additive for jet fuels
[DE81-030634] p0103 N82-11267	p0090 A82-12022
SOVIET UCG experience specifically related to	PAULT TRRES Failure mode analysis using state variables
field experiments in the United States	derived from fault trees with application
[DE81-028642] p0111 N82-13244 EXPLORATION	[DE81-030239] p0144 N82-15454 PEASIBILITY ANALYSIS
Exploration of coal and anthracitic carbonaceous	Present status of Plorida Power Corporation's
shale resources, Narragansett Basin,	D.O.E. funded feasibility study of the Higgins
Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523	plant repowering/coal gasification project p0089 A82-11834
EXTRACTION	Aquifer thermal energy storage - A feasibility
Sowiet UCG experience specifically related to field experiments in the United States	study for large scale demonstration p0154 A82-11846
[DE81-028642] p0111 N82-13244	Feasibility of a small scale pumped storage
F	demonstration project, Hibbing, Minnesota [DE81-028678] p0155 N82-10525
-	The young solar collector: An evaluation of its
Research activities of solar cells in EOC	multiple farm uses [PB81-214132] p0066 N82-10577
p0047 A82-11795	Low/medium-Btu coal-gasification assessment
n-/indium tin oxide//p-InP solar cells p0058 A82-16471	<pre>program for specific sites of two New York utilities</pre>
Low cost silicon-on-ceramic photovoltaic solar cells	[DE81-025518] p0101 N82-11240
p0059 A82-17098 Thin-film polycrystalline cadmium telluride solar	Peat biogasification development program p0101 N82-11243
cells and large-area polycrystalline silicon	Ethanol production in southern tier east region of
solar cells p0062 N82-10490	New York: Technical and economic feasibility [PB81-226979] p0011 N82-11275
Thin film photovoltaic devices	Assessment of the potential of coal-fueled heat
p0063 N82-10491 Silicon solar cell process development,	engines in total and integrated energy systems [DE82-000169] p0018 N82-12587
fabrication and analysis	Modular hydro dam approach to the economic
[NASA-CR-163787] p0063 N82-10500 Integrated function nonimaging concentrating	development of ultra low-head hydropower [DE81-027817] p0019 N82-12635
collector tubes for sclar thermal energy	Feasibility study report for the Imperial Valley
[DE81-029677] p0064 N82-10521 Fabrication, testing, and modeling plans for a	Ethanol Refinery: A 14.9-million-gallon-per-year ethanol synfuel
125-kW counter-rotating-turbine wave energy	refinery utilizing geothermal energy
converter [DE81-023946] p0137 N82-10559	[DE82-000288] p0112 N82-13252 Feasibility study for an alcohol-fuels plant for
Solar cell develorment for the power extension	Buffalo, New York
package [NASA-TM-82685] p0068 N82-11551	[DB82-000032] p0114 N82-14377 Evaluation of coal gasification/combined cycle
Low-cost solar flat-plate-collector development	power plant feasibility at the Sewells Point
[DE81-025081] p0070 N82-11584 Method for precision forming of low-cost,	Naval Complex, Norfolk, Virginia [AD-A103674] p0116 N82-14639
thin-walled slotted waveguide arrays for the SPS	Moorhead district heating, phase 2
p0148 N82-12558 High resolution, low cost solar cell contact	[DE81-029689] p0031 N82-15556 Micro-hydropower in the United States
development	[DE81-028271] p0031 N82-15567
[NASA-CR-165032] p0076 N82-13501 FACTOR ANALYSIS	FEDERAL BUDGETS
Solar panel current degradation factors	Photovoltaic market analysis program: Background, model development, applications and extensions
p0045 A82-11759 FAILURE	[DE81-029711] p0073 N82-12609
Millions wasted trying to develor major energy	FEEDBACK CONTROL Frequency response analysis of fluid control
information system	systems for parabolic-trough solar collectors
[AFHD-81-40] p0029 N82-14959 PAILURE AMALYSIS	[DE81-029293] p0064 N82-10513 FERTILIZERS
Performance of terrestrial photovoltaic modules at	Process for removing sulfur oxides from gases with
MIT Lincoln Laboratory experimental photovoltaic systems	direct production of a usable finished reaction product ammonium sulfate fertilizer
[DE81-029995] p0064 N82-10519	[BMFT-FE-T-81-102] p0029 N82-15142
Rectenna array measurement results p0149 N82-12564	FIBER COMPOSITES Dynamic stability of stacked disk type flywheels
Asymmetric stress and failure analysis	[DE81-030008] p0156 N82-10535
[DE81-026642] p0142 N82-13451 FAILURE HODES	SOL-CYCLE: A solar-assisted solvent-recycling process for asphalt-impregnation of fiber board
Failure modes and effects analysis of a	[DE81-903377] p0070 N82-11615
coal-slurry preheater [DE81-030425] p0117 N82-15221	FIBER OPTICS SPS fiber optic link assessment
Failure mode analysis using state variables	p0147 N82-12550
derived from fault trees with application [DB81-030239] F0144 N82-15454	FIBER ORIENTATION Optimum reinforcement shapes and paths for
FARADAY EFFECT	rotating composite shells
A design for an MHC power plant as a prime mover for a Naval Vessel	PIBLD BFFECT TRANSISTORS p0154 A82-14513
[AIAA PAPER 81-2575] p0129 A82-14032	SPS solid state autenna power combiner
FARM CROPS Energy balance and utilization of agricultural	PO149 N82-12567
waste on a farm [PB81-229262] p0115 N82-14385	Photoacoustic figure of merit for photothermal energy conversion efficiency
FATIGUE TESTS	p0121 A82-10192
An overview of fatigue failures at the Rocky Flats Wind System Test Center	Finite Lambertian source analysis of concentrators - Application to solar reflectors
p0125 A82-11828	p0060 A82-17294

PILTRATION Magheigues for goothermal liquid sampling and	PLIGHT PLANS Computer flight planning for fuel efficiency
Techniques for geothermal liquid sampling and analysis	p0006 A82-1728
[DE81-030151] p0098 N82-11149 PINANCIAL MANAGEMENT	The use of flight management computers in air carrier operations in the 1980s
Status of the Great Plains coal gasification plant	[AD-A105621] p0027 N82-1407
[EMD-81-64] p0107 N82-12242	PLIGHT TESTS
FINES Elemental composition of atmospheric	Experimental and analytical investigation of a fluidic power generator
fine-particles emitted from coal burned in a modern electric power plant equipped with a	[JPL-PUB-81-100] p0142-N82-1338
flue-gas desulfurization system	Conversion of municipal solid waste to energy,
[DE81-030073] p0033 N82-15610	Jacksonville, Florida, phase 1
PINITE ELEMENT METHOD Calculation of natural modes of vibration for	[DE82-000808] p0019 N82-12613 PLOW CHARACTERISTICS
rotor blades by the finite element method	One-dimensional equilibrium-chemistry flow model
[DFVLR-FB-81-07] p0136 N82-10452	for coal combustors
Three-dimensional, finite elemental model for	[DE81-027622] p0099 N82-1115
simulating heavier-than-air gaseous releases	Experimental and analytical investigation of a
Over variable terrain	fluidic power generator [JFL-PUB-81-100] p0142 N82-1338
[DE81-028689] p0032 882-15602 PIHLAND p0032 882-15602	[JFL-PUB-81-100] p0142 N82-13380 PLOW DISTRIBUTION
Sulfur in the air in the capital (Helsinki) metropolitan area: ITASAT-project	Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors
[RR-614.71] p0025 N82-13553	p0044 A82-11423
PIRE PREVENTION	Plow in geothermal wells. Part 4: Transition
Fire-protection research for energy technology:	criteria for two-phase flow patterns
Py 80 year end report	[DE81-028312] p0096 N82-10366
[DE82-000970] p0161 N82-14649 PISHBRIES	PLOW GEOMETRY Optimization of flow passage geometry for
The Seasat connercial demonstration program	air-heating, prate-type solar collectors
p0115 N82-14561	p0055 A82-14840
PIXED WINGS	PLOW MEASUREMENT
Wing design for light transport aircraft with	H-Coal product physical properties measurement
improved fuel economy . p0004 A82-14416	[DE81-029095] p0111 M82-13245 Numerical wind-speed simulation model
PLARE TERPERATURE	[DE82-000956] p0113 N82-1362
Soot formation in synfuels	PLOE STABILITY
[DE81-030273] p0099 N82-11164	Boiling flow instability of a fixed mirror
PLASH POINT	distributed focus solar receiver
Controlled-flash pyrolysis [DE82-000284] p0111 N82-13196	P0041 A82-10810
PLASHING (VAPORIZING)	Techniques for geothermal liquid sampling and
Measured performance of falling-jet flash	analysis
evaporators	[DB81-030151] p0098 N82-11149
[DE81-024355] p0161 N82-10565	Cool-down flow-rate limits imposed by thermal'
External fuel vaporization study [NASA-CR-165513] p0114 N82-14371	stresses in LNG pipelines [DE81-028731] p0150 N82-1448
PLAT PLATES	PLOWMETERS
The effect of inclination on the heat loss from	Density-measurement studies at the BI-GAS pilot
flat-plate solar collectors	plant
p0043 A82-11212 Optimization of heat losses in normal and reverse	[DE82-000910] p0108 N82-12262 PLUES
flat-plate collector configurations - Analysis	EPA utility FGD (Flue Gas Desulfurization) survey
and performance	[PB81-225773] P0015 N82-11679
p0059 A82-16744	Coal resources and sulphur emission regulations:
Solar project description for Public Service Company of New Mexico (lot 7) single family	A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-1551
residence, Rio Rancho, New Mexico	Demonstration of Wellman-Lord/Allied Chemical PGD
[DE81-027853] p0063 N82-10509	technology: Demontration test second year results
The young solar collector: An evaluation of its	[PB81-246316] p0034 N82-15620
multiple farm uses	Proceedings: Symposium on Flue Gas
[PB81-214132] p0066 N82-10577 Solar energy system performance evaluation:	Desulfurization, volume 1 [PB81-243156] p0035 N82-1565
Forest City Dillon, Washington, L.C., January	Proceedings: Symposium on Flue Gas
1980 - December 1980	Desulfurization, volume 2
[DE81-028174] p0068 N82-11560	[PB81-243164] p0035 N82-15652
Solar energy system performance evaluation:	FLUID FLOW
Montecito Pines, Santa Rosa, California, November 1979 - April 1980	Boiling flow instability of a fixed mirror but distributed focus solar receiver
[DE81-028175] p0068 N82-11561	p0041 A82-10810
Low-cost solar flat-plate-collector development	Prequency response analysis of fluid control
[DE81-025081] p0070 N82-11584	systems for parabolic-trough solar collectors
Improvement of thermal efficiency of flat plate solar collectors	[DE81-029293] p0064 N82-10513
[BMPT-FB-T-80-194] p0075 N82-12642	Experimental and analytical investigation of a
A Module Experimental Process System Development	fluidic power generator
Unit (MEPSDU)'	[JPL-PUB-81-100] p0142 N82-1338
[NASA-CR-165014] p0076 N82-13496	PLUIDIZED BED PROCESSORS
<pre>Plat-plate solar array project. Task 1: Silicon material: Investigation of the</pre>	An overview of fluidized-bed combustion /FBC/ design practice
hydrochlorination of SiC1sub4	p0090 A82-11850
[NASA-CR-165042] p0078 N82-14631	Cyclone performance estimates for pressurized
FLIGHT CONTROL	fluidized-bed combustion combined cycle
The role of avionics in the all electric airplane [AIAA 81-2219] r0002 A82-13457	power generation ' [DE81-028504] p0093 N82-1015
[AIAA 81-2219] F0002 A82-13457 The all-electric airplane - A new trend	Particulate processes in pulverized-coal flames
p0006 A82-17420	[DE81-025153] p0093 N82-1015
•	·

SUBJECT INDEX FOSSIL FUELS

Studies of the regeneration of activated bauxite	Accommont of flawhool creton bonofits in colorated
used as granular sorbent for the control of	Assessment of flywheel system benefits in selected vehicle applications
alkali vapors from hot flue gas of coal combustion	[DE81-025976] p0158 N82-11997
[DB81-030192] p0008 882-10590	Plywheel rotor and containment technology
Pluidized bed coal combustion reactor	development
[NASA-CASE-BPO-14273-1] p0097 N82-11144 Assessment of advanced coal gasification processes	[DE81-028047] p0159 N82-14655 POANTING
[HASA-CR-164949] P0098 H82-11146	Field demonstration of the conventional steam
Tennessee Valley Authority atmospheric	drive process with ancillary materials
fluidized-bed combustor simulation	[DB81-026849] p0115 B82-14522
[DB81-030262] p0098 N82-11151	Pield demonstration of the conventional steam
Atmospheric fluidized-bed projects technology overview	drive process with ancillary materials [DE81-026962] p0115 N82-14523
[DB81-027143] p0102 H82-11251	POAMS
Surface coal gasification	Practure mechanics of cellular glass
[DE81-030183] p0102 H82-11253	[MASA-CR-164959] p0066 M82-11209
Lewis Research Center's coal-fired, pressurized, fluidized-bed reactor test facility	FOCUSING The Rogers focusing heliostat experimental program
[NASA-TH-81616] p0103 N82-11397	at Rensselaer Polytechnic Institute
Fluid-bed heat-exchanger optimization and bed	[PB81-226813] p0071 N82-11625
materials selection	FOOD PROCESSING
[DOE/RT-11343/T2] p0104. N82-11571	Energy expenditure and dietary change
Industrial application of fluidized-bed combustion [DE81-030272] p0105 N82-12182	[PB81-218471] p0009 N82-10717 FORECASTING
Thermal processing of used catalysts	Utility operating strategy and requirements for
[BMFT-FB-T-80-189] p0016 N82-12205	the wind power forecast
Development of hydroconversion of biomass to	[AIAA PAPER 81-2539] p0127 A82-14007
synthetic fuels [DE81-030954] p0108 N82-12260	US energy strategies: Some options for eliminating oil imports by the year 2000
Energy recovery from municipal waste development	[PB81-226052] p0014 N82-11626
program for Idaho Palls, Idaho	Models for forecasting energy use in the US farm
[DE81-029999] p0028 N82-14659	Sector -0040 703 43500
Coal and limestone feed testing for atmospheric fluidized bed combustion	[DE81-904220] p0018 N82-12580 FOREST HAWAGEMENT
[DE81-030629] p0117 N82-15222	Wood resources and utilization patterns in the
Real time coarse particle mass measurements in a	North Central Region and energy needs for the
high temperature and pressure coal gasifier	manufacture of wood products
process treatment [DE81-030036] p0033 #82-15609	[DE81-030356] p0019 N82-12604 PORMATIONS
Evaluating R and D options under uncertainty.	Comparison of Michigan Basin crude oils
Volume 2: Atmospheric fluidized-bed combustion	p0091 A82-17007
commercialization strategies [DE81-904246] p0035 #82-16012	FORMING TECHNIQUES Method for precision forming of low-cost,
FLUORIDES	thin-walled slotted waveguide arrays for the SPS
Performance of a cylindrical phase change thermal	p0148 N82-12558
energy storage unit	POSSIL FUELS
energy storage unit [AIAA PAPER 82-0076] . p0155 A82-17770	POSSIL FUELS Overview of DOE's large stationary Stirling engine
energy storage unit	POSSIL FUELS
energy storage unit [AIAA PAPER 82-0076] . p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology	POSSIL FUELS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production	POSSIL FUELS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 FLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787	POSSIL FUELS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology
energy storage unit [AIAA PAPER 82-0076] . p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine	POSSIL FUELS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] p0094 N82-10250 Baseline data on utilization of low-grade fuels in
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPEE 81-2572] p0129 A82-14029	POSSIL FUELS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] p0094 N82-10250 Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 FLUOROPOLIMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 FLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] p0129 A82-14029 FLUX DEWSITY	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPEE 81-2572] p0129 A82-14029	POSSIL FUELS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] p0094 N82-10250 Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPEE 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer	POSSIL FUELS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] p0094 N82-10250 Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] p0006 N82-10254 Water-cooled gas turbine development program [DE81-904245] p0136 N82-10406
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPEE 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 M82-12537	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER AWALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [PFA-134] p0140 N82-12537 PLY BY WIRE COSTROL	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPEE 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 M82-12537	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 M82-12537 PLY BY WIRE COSTEOL The all-electric airplane - A new trend p0006 A82-17420	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582]
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER AWALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [PPA-134] p0140 N82-12537 PLY BY WIER COSTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER AWALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPEE 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [PPA-134] p0140 M82-12537 PLY BY WIRE COSTEGL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of composite materials	POSSIL FUELS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification pol89 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Peasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER AWALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [PPA-134] p0140 N82-12537 PLY BY WIER COSTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER AWALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [PPA-134] p0140 N82-12537 PLY BY WIER CONTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Hethod of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification po089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] DO105 N82-11573 Survey of particulate emission macro- and
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 FLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 FLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] p0129 A82-14029 FLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FPA-134] p0140 N82-12537 FLY BY WIRE CONTROL The all-electric airplane - A new trend p0006 A82-17420 FLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Peasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] DE81-028678] Preliminary evaluation of advanced coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macro- and micro-sampling and sizing methods
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 PLUN DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 N82-12537 PLY BY WIRE COSTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shapes and paths for	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macro- and micro-sampling and sizing methods [DE81-028348]
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER AWALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPEE 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [PPA-134] p0140 N82-12537 PLY BY WIRE CONTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shapes and paths for rotating composite shells	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Peasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] DE81-028678] Preliminary evaluation of advanced coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macro- and micro-sampling and sizing methods
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 FLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] p0129 A82-14029 FLUX DENSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FPA-134] p0140 N82-12537 FLY BY WIRE CONTROL The all-electric airplane - A new trend p0006 A82-17420 FLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shares and paths for rotating composite shells p0154 A82-14513 Hechanical energy storage technology project	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macroand micro-sampling and sizing methods [DE81-028348] Solid and hazardous energy wastes: Synfuels. 1: Beview of research activities [DE81-028503] p0014 N82-11644
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 PLUI DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 M82-12537 PLY BY WIRE COSTEOL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shapes and paths for rotating composite shells Mechanical energy storage technology project [DE81-029753]	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification p0089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macro- and micro-sampling and sizing methods [DE81-028348] Solid and hazardous energy wastes: Synfuels. 1: Beview of research activities [DE81-028503] P0014 N82-11644 Economic assessment of advanced central-receiver
energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770 FLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] p0129 A82-14029 FLUX DENSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FPA-134] p0140 N82-12537 FLY BY WIRE CONTROL The all-electric airplane - A new trend p0006 A82-17420 FLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shares and paths for rotating composite shells p0154 A82-14513 Hechanical energy storage technology project	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program p0123 A82-11805 An overview of peat gasification liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macroand micro-sampling and sizing methods [DE81-028348] Solid and hazardous energy wastes: Synfuels. 1: Beview of research activities [DE81-028503] p0014 N82-11644
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 PLUX DEMSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [PPA-134] p0140 N82-12537 PLY BY WIRE COSTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shares and paths for rotating composite shells p0154 A82-14513 Mechanical energy storage technology project [DE81-029753] OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macro- and micro-sampling and sizing methods [DE81-028348] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] Economic assessment of advanced central-receiver solar-thermal power systems: Executive summary [DOE/SF-10601/0] Overview of the biomedical and environmental
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 PLUI DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 M82-12537 PLY BY WIRE COMTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 Mechanical energy storage technology project [DE81-029753] p0155 N82-10508 OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation [DE81-029701] p0007 N82-10514	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification po089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macro- and micro-sampling and sizing methods [DE81-028348] Solid and hazardous energy wastes: Synfuels. 1: Beview of research activities [DE81-028503] FCONOMIC SESSEMENT OF Advanced central-receiver solar-thermal power systems: Executive summary [DOE/SF-10601/0] Overview of the biomedical and environmental programs at the Oak Ridge National Laboratory
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 N82-12537 PLY BY WIRE COSTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shares and paths for rotating composite shells p0154 A82-14513 Mechanical energy storage technology project [DE81-029753] p0155 N82-10508 OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation [DE81-029701] p0007 N82-10514 Dynamic stability of stacked disk type flywheels	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification po089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-028989] Survey of particulate emission macro- and micro-sampling and sizing methods [DE81-028348] Solid and hazardous energy wastes: Synfuels. 1: Beview of research activities [DE81-028503] Economic assessment of advanced central-receiver solar-thermal power systems: Executive summary [DOE/SF-10601/0] P0074 N82-11644 Programs at the Oak Ridge National Laboratory [DE81-027864]
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 PLUI DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 M82-12537 PLY BY WIRE COMTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 Mechanical energy storage technology project [DE81-029753] p0155 N82-10508 OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation [DE81-029701] p0007 N82-10514	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification po089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macro- and micro-sampling and sizing methods [DE81-028348] Solid and hazardous energy wastes: Synfuels. 1: Beview of research activities [DE81-028503] FCONOMIC SESSEMENT OF Advanced central-receiver solar-thermal power systems: Executive summary [DOE/SF-10601/0] Overview of the biomedical and environmental programs at the Oak Ridge National Laboratory
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 FIJOROPOLIMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 FIUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 FLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 N82-12537 FLY BY WIRE COSTROL The all-electric airplane - A new trend p0006 A82-17420 FLYWHERLS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 Mechanical energy storage technology project [DE81-029753] OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation [DE81-029701] p0007 N82-10514 Dynamic stability of stacked disk type flywheels [DE81-030008] Composite flywheel balance experience [DE81-769341] p0157 N82-10549	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification po089 A82-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macro- and micro-sampling and sizing methods [DE81-028348] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] Economic assessment of advanced central-receiver solar-thermal power systems: Executive summary [DOE/SP-10601/0] Overview of the biomedical and environmental programs at the Oak Ridge National Laboratory [DE81-027864] Rate coefficients of combustion/fuel conversion reactions by high-temperature photochemistry [DB81-027965]
energy storage unit [AIMA PAPER 82-0076] PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production PLUTTER MBALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIMA PAPER 81-2572] PLUI DEBSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] PLY BY WIRE CONTEOL The all-electric airplane - A new trend p0006 A82-17420 PLYWHEELS Method of determining the creep characteristics of composite materials PO154 A82-11779 Energy conservation through utilization of mechanical energy storage Optimum reinforcement shapes and paths for rotating composite shells Mechanical energy storage technology project [DE81-029753] OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation [DR81-029701] Dynamic stability of stacked disk type flywheels [DE81-030008] Composite flywheel balance experience [DE81-769341] Testing and evaluation of a solar photovoltaic	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification power passe fuels in power peat gasification power power peat gasification power power peat gasification power power peat gasification power peat gasification power peat gasification power power peat gasification power peat gasification power power peat gasification power power peat gasification power power peat gasification power peat gasificati
energy storage unit [AIRA PAPER 82-0076] p0155 A82-17770 FIJOROPOLIMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 FIUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIRA PAPER 81-2572] p0129 A82-14029 FLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 N82-12537 FLY BY WIRE COSTROL The all-electric airplane - A new trend p0006 A82-17420 FLYWHERLS Method of determining the creep characteristics of composite materials p0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 Mechanical energy storage technology project [DE81-029753] OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation [DE81-029701] p0007 N82-10514 Dynamic stability of stacked disk type flywheels [DE81-030008] Composite flywheel balance experience [DE81-769341] p0157 N82-10549	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification po089 A82-11848 Liquid fossil fuel technology [DB81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DB81-903764] Water-cooled gas turbine development program [DB81-904245] Peasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DB81-028678] Computational tools for pulverized-coal combustion [DB81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DB81-02989] Survey of particulate emission macro- and micro-sampling and sizing methods [DB81-029348] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DB81-028503] DOE(SF-10601/0] Overview of the biomedical and environmental programs at the Oak Ridge National Laboratory [DB81-027864] Rate coefficients of combustion/fuel conversion reactions by high-temperature photochemistry [DB81-027965] Development of peatlands in northern Minnesota [DB82-000873]
energy storage unit [AIAA PAPER 82-0076] PLUOROPOLYMERS Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production PLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] PLUX DEWSITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FPA-134] PLY BY WIRE CONTROL The all-electric airplane - A new trend p0006 A82-17420 PLYWHERLS Method of determining the creep characteristics of composite materials P0002 A82-11779 Energy conservation through utilization of mechanical energy storage P0002 A82-11845 Optimum reinforcement shares and paths for rotating composite shells Mechanical energy storage technology project [DE81-029753] OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation [DE81-029701] Dynamic stability of stacked disk type flywheels [DE81-030008] Composite flywheel balance experience [DE81-769341] Testing and evaluation of a solar photovoltaic flywheel energy storage Technology (MEST)	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol23 A82-11805 An overview of peat gasification power passe fuels in power peat gasification power power peat gasification power power peat gasification power power peat gasification power peat gasification power peat gasification power power peat gasification power peat gasification power power peat gasification power power peat gasification power power peat gasification power peat gasificati
energy storage unit [AIAN PAPER 82-0076] p0155 A82-17770 FLUORDOLYMBES Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production PO083 A82-11787 FLUTTER ABALYSIS An aeroelastic analysis of the Darrieus wind turbine [AIAN PAPER 81-2572] p0129 A82-14029 FLUI DEESITY A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind shear layer [FFA-134] p0140 N82-12537 FLY BY WIRE COBTROL The all-electric airplane - A new trend p0006 A82-17420 FLYWHEELS Method of determining the creep characteristics of composite materials P0154 A82-11779 Energy conservation through utilization of mechanical energy storage p0002 A82-11845 Optimum reinforcement shapes and paths for rotating composite shells P0154 A82-14513 Mechanical energy storage technology project [DE81-029753] DESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation [DE81-029701] Dynamic stability of stacked disk type flywheels [DE81-030008] Composite flywheel balance experience [DE81-769341] Testing and evaluation of a solar photovoltaic flywheel energy storage system [D0E/ET-20279/130] P0065 N82-10558	POSSIL FUBLS Overview of DOE's large stationary Stirling engine development program pol 123 A82-11805 An overview of peat gasification pol 8482-11848 Liquid fossil fuel technology [DE81-029912] Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions evaluation [DE81-903764] Water-cooled gas turbine development program [DE81-904245] Peasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Computational tools for pulverized-coal combustion [DE81-028582] Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis [DE81-029989] Survey of particulate emission macro- and micro-sampling and sizing methods [DE81-028348] Solid and hazardous energy wastes: Synfuels. 1: Beview of research activities [DE81-028348] Economic assessment of advanced central-receiver solar-thermal power systems: Executive summary [DOC/SP-10601/0] Overview of the biomedical and environmental programs at the Oak Ridge National Laboratory [DE81-027864] Rate coefficients of combustion/fuel conversion reactions by high-temperature photochemistry [DE81-027965] Development of peatlands in northern Minnesota [DE82-000873] Development of peatlands in northern Minnesota [DE82-000873] Design and test of two-step solar oil shale retort

PRACTIONATION SUBJECT INDEX

Update on Specified European R and	D Efforts.	Puture of electricity for automobi	les: Advanced
Part 1: Appendices [DE81-026404]	p0143 N82-13983	electric vehicle concepts [DB81-028235]	D0029 N82-14987
Fuels and chemicals made from solar	energy	FUEL COMBUSTION	
[DB81-025018]	p0077 N82-14384	Characteristics of combustion and programmed formation in swirling flames	pollutant
Fundamentals of nitric cxide format: fossil-fuel combustion	ten in	lotadelon in Sailling lidmes	p0001 A82-10875
[DB81-030329]	p0033 N82-15608	Conceptual design of 500 to 3000 h	
FRACTIONATION Cryogenic methane separation/cataly:	tic	engines for stationary power gen	eration p0123 A82-11807
hydrogasification process analysis		An overview of fluidized-bed combu	-
[DE81-029123]	p0093 N82-10152	design practice	2000 100 44050
Process development for improved SE Kerr-McGee critical sclvent deash:		Study of the electric conductivity	p0090 A82-11850
fractionation studies	,	fuel combustion products contain	
[DE81-903765] FRACTIONS	p0114 N82-14380	lonizing impurity	p0091 A82-12888
Identification and toxicity of		Synthetic-fuel combustion; pollutar	-
fractionated-shale-oil components		Soot-initiation mechanisms in bu	rning aromatics
[DE81-028460] PRACTURE MECHANICS	p0021 N82-12766	[DE81-029480] Pulverized-fuer combustion: Model:	p0093 N82-10155
Fracture mechanics of cellular glass	5	methodologies	ing and bouzoup
[NASA-CR-164959]	p0066 N82-11209	[DE81-026546]	p0093 N82-10158
PRACTURE STRENGTH Dimensions, volume 65, number 3		Study of the formation of submicron generated by coal combustion	particulates
[PB81-235053]	p0161 N82-15436	[DE81-027447]	p0008 N82-10586
FRACTURING Hot dry rock geothermal energy devel	lenment program	Atmospheric fluidized-bed projects overview	technology
[LA-UR-81-1265]	p0097 N82-10560	[DE81-027143]	p0102 N82-11251
PREOF	- -	Workshop proceedings: Combustion	Turbine Residual
Design and develorment of a reciproc low-temperature freon expander	cating	0i1 [EPRI-WS-80-132]	p0103 N82-11261
[DE81-028609]	p0023 N82-13392	Third automotive fuel economy research	
PREQUENCY CONTROL	cleatric	coordination meeting [PB81-222754]	p0014 N82-11627
Control of new energy sources in an utility system	GIECTIC	Fuel nitrogen conversion during fue	
	p0154 A82-13082	combustion of pulverized coal and	d char
Wind-energy recovery by a static Sci	herbius	Evaluation of shale oil as a utili	p0105 N82-12156 tv gas-turbine
induction generator		fuel	
PRESBEL LEBSES	p0131 A82-15650	[DE81-904234] Rate coefficients of combustion/fu	p0107 N82-12251
Efficiency of Presnel lenses		reactions by high-temperature pho	
•	p0043 A82-11387	[DE81-027965]	p0023 N82-13192
Channel - channel - cff			
Chromatic aberration effect on solar systems using Fresnel lenses	energy	Environmental effects of pollutants combustion. 2: The Colstrip, Mo	
systems using Fresnel lenses	p0052 A82-13284	combustion. 2: The Colstrip, Mo [PB81-234114]	
systems using Fresnel lenses Theoretical analysis of the Fresnel	p0052 A82-13284 lens as a	combustion. 2: The Colstrip, Ma [PB81-234114] FURL COMSUMPTION	p0026 N82-13573
systems using Fresnel lenses	p0052 182-13284 lens as a for solar	combustion. 2: The Colstrip, Mo [PB81-234114] FUEL COMSUMPTION Characteristics and trends of ener- in transport missions with aircra	pontana Power Plant p0026 N82-13573 gy consumption
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters concentrators	p0052 A82-13284 lens as a for solar p0059 A82-16599	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energy	pontana Power Plant p0026 N82-13573 gy consumption aft and surface
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters	p0052 A82-13284 lens as a for solar p0059 A82-16599	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent magentics.	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 N82-10495
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters concentrators Automated Presnel lens tester system [DE81-029483] FRESHEL REFLECTORS	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863	combustion. 2: The Colstrip, Mo [PB81-234114] FURL CONSUMPTION Characteristics and trends of energin transport missions with aircravehicles	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483]	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent magentics.	pontana Power Plant p0026 N82-13573 by consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560]	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863	combustion. 2: The Colstrip, More [PB81-234114] PUBL COBSUMPTION Characteristics and trends of energin transport missions with aircress vehicles A hidden advantage of permanent managemerating systems	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 N82-10495 gnet electrical p0122 N82-11720 atton of
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESHEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FUEL CELLS	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550	combustion. 2: The Colstrip, Market PB81-234114] FURL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent managenerating systems Energy conservation through utilization mechanical energy storage	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 N82-10495 gnet electrical p0122 N82-11720 atton of
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560]	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 An historical	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent maggenerating systems Energy conservation through utilization mechanical energy storage Fuel conservation - DC-9 series 20,	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 N82-10495 gnet electrical p0122 N82-11720 ation of p0002 N82-11845 /30/40 p0002 N82-12563
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560] FUEL CELLS The nickel-hydrogen battery system overview	p0052 A82-13284 lens as a for solar p0059 A82-16599 p0066 N82-10863 s for parabolic p0068 N82-11550 An historical p0153 A82-11735	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent maggenerating systems Energy conservation through utilization mechanical energy storage Fuel conservation - DC-9 series 20, Fuel efficient flight profiles in a	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 N82-10495 gnet electrical p0122 N82-11720 ation of p0002 N82-11845 730/40 p0002 N82-12563
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESHEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FUEL CELLS	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 An historical p0153 A82-11735 System	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent magenerating systems Energy conservation through utilization mechanical energy storage Fuel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 /30/40 p0002 A82-12563 in ATC flow p0002 A82-13078
systems using Fresnel lenses Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REFLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FURL CRILS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy S development	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent maggenerating systems Energy conservation through utilization mechanical energy storage Puel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment Wing design for light transport air	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 /30/40 p0002 A82-12563 an ATC flow p0002 A82-13078
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESHEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FUBL CELLS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy S	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent magenerating systems Energy conservation through utilization mechanical energy storage Fuel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 /30/40 p0002 A82-12563 in ATC flow p0002 A82-13078
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REFLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FUEL CELLS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy S development Evaluation of organic acids as fuel electrolytes	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 An historical p0153 A82-11735 System p0047 A82-11773 cell p0127 A82-12938	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent magenerating systems Energy conservation through utilizate mechanical energy storage Puel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its devices.	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 /30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 ccraft with
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560] FUBL CELLS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy S development Evaluation of organic acids as fuel	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773 cell p0127 A82-12938	combustion. 2: The Colstrip, Margaret PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent marganerating systems Energy conservation through utilizate mechanical energy storage Fuel conservation - DC-9 series 20, Fuel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 /30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 ccraft with
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Presnel lens tester system [DE81-029483] PRESNEL REFLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FUBL CELLS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Sevelopment Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system obesign of a cell for electrode kines	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 System p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent maggenerating systems Energy conservation through utilizate mechanical energy storage Fuel conservation - DC-9 series 20, Fuel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its devilogistic support Fuel conservation measures in South	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 atton of p0002 A82-11845 (30/40 p0002 A82-12563 an ATC flow p0002 A82-14416 great with p0004 A82-14416 great and p0004 A82-14709 a African
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560] FURL CRILS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy seven development Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 System p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent magenerating systems Energy conservation through utilizate mechanical energy storage Puel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its devilogistic support Puel conservation measures in South airways - A review of activity and	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 atton of p0002 A82-11845 (30/40 p0002 A82-12563 an ATC flow p0002 A82-14416 great with p0004 A82-14416 great and p0004 A82-14709 a African
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Presnel lens tester system [DE81-029483] PRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560] PUBL CELLS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy seven development Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system investigations of fuel cell reactifunctions of fuel cell reactifunctions on fuel cell reactifunctions.	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic icons p0136 A82-18394	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent managementing systems Energy conservation through utilizate mechanical energy storage Fuel conservation - DC-9 series 20, Fuel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its developistic support Fuel conservation measures in South airways - A review of activity are future developments	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 N82-10495 gnet electrical p0122 N82-11720 ation of p0002 N82-11845 /30/40 p0002 N82-12563 an ATC flow p0002 N82-13078 coraft with p0004 N82-14416 relopment and p0004 A82-14709 a African id a glimpse of p0004 N82-15598
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FURL CRILS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Sevended development Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system of a cell for electrode kinet investigations of fuel cell reactions	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 System p0047 A82-11773 cell p0127 A82-12938 cems p0131 A82-15069 cic ions p0136 A82-18394 cells for	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent magenerating systems Energy conservation through utilizate mechanical energy storage Puel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its devilogistic support Puel conservation measures in South airways - A review of activity and	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 atton of p0002 A82-11845 //30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 coraft with p0004 A82-14416 //clopment and p0004 A82-14709 affican aglimpse of p0004 A82-15598 gas turbine
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Presnel lens tester system [DE81-029483] PRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560] PUBL CELLS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy seven development Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system investigations of fuel cell reactifunctions of fuel cell reactifunctions on fuel cell reactifunctions.	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic ions p0136 A82-18394 cells for p0137 N82-10493	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent maggenerating systems Energy conservation through utilizate mechanical energy storage Fuel conservation - DC-9 series 20, Fuel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its developistic support Fuel conservation measures in South airways - A review of activity are future developments Ceramics for the AGT101 automotive Fuel conservation now improvement	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 //30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 ccraft with p0004 A82-14416 relopment and p0004 A82-14709 a African and a glimpse of p0004 A82-15598 gas turbine p0132 A82-16827 ents for
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Presnel lens tester system [DE81-029483] PRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FUBL CELLS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Sevelopment Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system investigations of fuel celi reactifuses fundamental investigations on fuel certainsportation applications Rechargeable molten-salt cells [DE81-027091]	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 System p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic tons p0136 A82-18394 rells for p0137 N82-10493 p0158 N82-11595	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent maggenerating systems Energy conservation through utilizate mechanical energy storage Puel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its devilogistic support Puel conservation measures in South airways - A review of activity are future developments Ceramics for the AGT101 automotive	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 /30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 craft with p0004 A82-14416 //elopment and p0004 A82-14709 a African and a glimpse of p0004 A82-15598 gas turbine p0132 A82-16827 exts for craft with
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FURL CRILS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Seventation of organic acids as fuel electrolytes Carbonate fuel cell power plant system investigations of fuel cell reactions. Fundamental investigations on fuel of transportation applications. Rechargeable molten-salt cells	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 System p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic tons p0136 A82-18394 rells for p0137 N82-10493 p0158 N82-11595	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent maggenerating systems Energy conservation through utilizate mechanical energy storage Fuel conservation - DC-9 series 20, Fuel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its developistic support Fuel conservation measures in South airways - A review of activity are future developments Ceramics for the AGT101 automotive Fuel conservation now improvement	potana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 atton of p0002 A82-11845 //30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 coraft with p0004 A82-14416 relopment and p0004 A82-14709 a African a glimpse of p0004 A82-15598 gas turbine p0132 A82-16827 ents for aircraft p0005 A82-17281
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560] FURL CRILS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Seventation of organic acids as fuel electrolytes Carbonate fuel cell power plant system investigations of fuel cell reactifunctions Rechargeable molten-salt cells [DE81-027091] Energy savings by means of fuel-cell electro-chemical industries [DE81-030975]	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic ions p0136 A82-18394 cells for p0137 N82-10493 p0158 N82-11595 t electrodes in p0018 N82-12582	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent managementing systems Energy conservation through utilizate mechanical energy storage Fuel conservation - DC-9 series 20, Fuel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its developistic support Fuel conservation measures in South airways - A review of activity and future developments Ceramics for the AGT101 automotive Fuel conservation now improvement existing production run transport Energy savings with today's technolaircraft fuel management through	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 //30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 craft with p0004 A82-14416 relopment and p0004 A82-14709 a African and a glimpse of p0004 A82-15598 gas turbine p0132 A82-16827 ents for caircraft p0005 A82-17281
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REFLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560] FURL CRILS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164560] FURL CRILS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Secondary and color concentration of creating secondary system overview Carbonate fuel cell power flant system concentration of fuel cell reacting system of fuel cell reacting system of fuel cell reacting concentration applications Rechargeable molten-salt cells [DR81-027091] Energy savings by means of fuel-cell electro-chemical industries	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic ions p0136 A82-18394 cells for p0137 N82-10493 p0158 N82-11595 t electrodes in p0018 N82-12582	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent maggenerating systems Energy conservation through utilizate mechanical energy storage Puel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its develogistic support Puel conservation measures in South airways - A review of activity are future developments Ceramics for the AGT101 automotive Puel conservation now improvement existing production run transport energy savings with today's technologies.	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 atton of p0002 A82-11845 //30/40 p0002 A82-12563 an ATC flow p0002 A82-14416 relopment and p0004 A82-14416 relopment and p0004 A82-14709 an African and a glimpse of p0004 A82-15598 gas turbine p0132 A82-16827 ents for aircraft p0005 A82-17281
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REFLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FURL CRILS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Stevelopment Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system investigations of fuel cell reactifications Rechargeable molten-salt cells [DE81-027091] Energy savings by means of fuel-cell electro-chemical industries [DE81-026842] Develop and test fuel cell powered of	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic tions p0136 A82-18394 rells for p0137 N82-10493 p0158 N82-11595 telectrodes in p0018 N82-12582 sis p0142 N82-13451 ten-site	combustion. 2: The Colstrip, He [PB81-234114] FUEL COMSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent managementing systems Energy conservation through utilizate mechanical energy storage Fuel conservation - DC-9 series 20, Fuel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its developistic support Fuel conservation measures in South airways - A review of activity and future developments Ceramics for the AGT101 automotive Fuel conservation now improvement existing production run transport Energy savings with today's technolaircraft fuel management through	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 atton of p0002 A82-11845 //30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 craft with p0004 A82-14416 //elopment and p0004 A82-14709 and African and a glimpse of p0004 A82-15598 gas turbine p0132 A82-16827 ents for caircraft p0005 A82-17281 logy in-flight p0005 A82-17282 efficiency
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Presnel lens tester system [DE81-029483] PRESNEL REFLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FUBL CELLS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Sevelopment Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system investigations of fuel cell reactifus fundamental investigations on fuel cell reactifus [DE81-027091] Energy savings by means of fuel-cell electro-chemical industries [DE81-030975] Asymmetric stress and failure analyse [DE81-026842] Develop and test fuel cell powered cell integrated total energy system.	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 System p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic tons p0136 A82-18394 rells.for p0137 N82-10493 p0158 N82-11595 electrodes in p0018 N82-12582 sis p0142 N82-13451 rn-site chase 3:	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent managemerating systems Energy conservation through utilizate mechanical energy storage Puel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its devilogistic support Puel conservation measures in South airways - A review of activity are future developments Ceramics for the AGT101 automotive Puel conservation now improveme existing production run transport Energy savings with today's technol aircraft fuel management through monitoring Computer flight planning for fuel experiences.	pontana Power Plant p0026 N82-13573 gy consumption and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 /30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 craft with p0004 A82-14416 relopment and p0004 A82-14709 a African and a glimpse of p0004 A82-15598 gas turbine p0132 A82-16827 ents for aircraft p0005 A82-17281 logy in-flight p0005 A82-17282 efficiency p0006 A82-17289
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Presnel lens tester system [DE81-029483] PRESHRL REPLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] PDRL CRILS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Sevent development Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system investigations of fuel cell reactions applications Rechargeable molten-salt cells [DE81-027091] Energy savings by means of fuel-cell electro-chemical industries [DE81-030975] Asymmetric stress and failure analys [DE81-026842] Develop and test fuel cell powered contegrated total energy system. In Pull-scale power plant development [NASA-CR-165328]	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic tons p0136 A82-18394 tells for p0137 N82-10493 p0158 N82-11595 telectrodes in p0018 N82-12582 sis p0142 N82-13451 tm-site thase 3: p0142 N82-13490	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent managemerating systems Energy conservation through utilizate mechanical energy storage Fuel conservation - DC-9 series 20, Fuel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its develogistic support Fuel conservation measures in South airways - A review of activity are future developments Ceramics for the AGT101 automotive Fuel conservation now improveme existing production run transport Energy savings with today's technol aircraft fuel management through monitoring Computer flight planning for fuel of the all-electric airplane - A new of the all-electric airplane - A new of the conservation aircraft fuel management through monitoring	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 /30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 craft with p0004 A82-14416 yelopment and p0004 A82-14709 african ad a glimpse of p0004 A82-15598 gas turbine p0132 A82-16827 ents for aircraft p0005 A82-17281 logy in-flight p0005 A82-17282 efficiency p0006 A82-17289 crend p0006 A82-17289
Theoretical analysis of the Fresnel function of design parameters concentrators Automated Fresnel lens tester system [DE81-029483] FRESNEL REFLECTORS Secondary and compound concentrators dish solar thermal power systems [NASA-CR-164960] FURL CRLLS The nickel-hydrogen battery system overview The Texas Instruments Sclar Energy Sevelopment Evaluation of organic acids as fuel electrolytes Carbonate fuel cell power plant system investigations of fuel cell reactives [DE81-027091] Energy savings by means of fuel-cell electro-chemical industries [DE81-030975] Asymmetric stress and failure analys [DE81-026842] Develop and test fuel cell powered cintegrated total energy system. Full-scale power plant development	p0052 A82-13284 lens as a for solar p0059 A82-16599 a p0066 N82-10863 s for parabolic p0068 N82-11550 - An historical p0153 A82-11735 system p0047 A82-11773 cell p0127 A82-12938 tems p0131 A82-15069 tic tons p0136 A82-18394 tells for p0137 N82-10493 p0158 N82-11595 telectrodes in p0018 N82-12582 sis p0142 N82-13451 tm-site thase 3: p0142 N82-13490	combustion. 2: The Colstrip, He [PB81-234114] FUEL COBSUMPTION Characteristics and trends of energin transport missions with aircravehicles A hidden advantage of permanent managemerating systems Energy conservation through utilizate mechanical energy storage Puel conservation - DC-9 series 20, Puel efficient flight profiles in a management environment Wing design for light transport air improved fuel economy The all electric airplane - Its devilogistic support Puel conservation measures in South airways - A review of activity are future developments Ceramics for the AGT101 automotive Puel conservation now improveme existing production run transport Energy savings with today's technol aircraft fuel management through monitoring Computer flight planning for fuel experiences.	pontana Power Plant p0026 N82-13573 gy consumption aft and surface p0001 A82-10495 gnet electrical p0122 A82-11720 ation of p0002 A82-11845 /30/40 p0002 A82-12563 an ATC flow p0002 A82-13078 craft with p0004 A82-14416 yelopment and p0004 A82-14709 african ad a glimpse of p0004 A82-15598 gas turbine p0132 A82-16827 ents for aircraft p0005 A82-17281 logy in-flight p0005 A82-17282 efficiency p0006 A82-17289 crend p0006 A82-17289

EPA evaluation of the FUEL-MAX device under	
Section 511 of the Motor Vehicle Information and	
Cost Savings Act	
[PB81-229866] p0012 N82-11479)
EPA evaluation of the Automotive Cylinder	
Deactivator System (ACDS) under Section 511 of	
the Motor Vehicle Information and Cost Saving Act [PB81-228256] p0013 N82-11480	
[PB81-228256] p0013 N82-11486 Evaluation of the micrc-carburetor	•
[NASA-CR-164958] p0016 N82-1199	ı
AGT-102 automotive gas turbine	
[NASA-CR-165353] p0140 N82-12444	ŧ
National interim energy-consumption survey:	
Exploring the variability in energy consumption	
[DE81-029910] p0018 N82-12589	,
Performance analysis of 11 Denver Metro passive homes	
[DB81-025473] p0074 N82-12620	
Impact of fuel-economy shortfall: Trends in	•
technology-weighted EPA versus on-road MPG.	
Periodic analysis memorandum no. 1	
[DE81-030841] p0020 N82-1266	,
Augmentation of research and analysis capabilities	
for timely support of automotive fuel economy	
activities. Volume 1: Summary [PB81-219479] p0022 N82-1301	
Augmentation of research and analysis capabilities	•
for timely support of automotive fuel economy	
activities. Volume 2: Appendices A through C	
[PB81-219487] p0022 N82-13019)
Augmentation of research and analysis capabilities	
for timely support of automotive fuel economy activities. Volume 3: Appendix D	
[PB81-219495] p0022 N82-13020	`
Performance characteristics of automotive engines	
in the United States, third series: 1977	
Chrysler 318 CID (5.2L), 2V	
[PB81-233025] p0023 N82-13435	j
Controlled Speed Accessory Drive demonstration program	
[NASA-CR-165010] p0026 N82-1398	
Evaluation of techniques for reducing in-use	
automotive fuel consumption	
[PB81-233298] p0026 N82-13989	j
Highway fuel economy study [PB81-233850] p0026 N82-1398	
The use of flight management computers in air	•
carrier operations in the 1980s	
[AD-A105621] p0027 N82-1407	ı
Automotive fuel economy: Potential improvement through selected engine and differential gear	
lubricants	
[PB81-240467] p0030 N82-1545	ł
Fuels and electric energy consumed	
[PB81-240442] p0032 N82-15594	ļ
PUEL CORROSION A protective additive for jet fuels	
p0090 A82-1202	,
FUEL PLON	•
Transport characteristics of alternate slurry fuels	
[DB81-028580] p0146 N82-11253	į
PUBL INJECTION	
A study of factors influencing thermally induced backfiring in hydrogen fueled engines, and	
methods for backfire control	
p0084 A82-11791	
External fuel vaporization study	
[NASA-CR-165513] p0114 N82-14371	
FURL OILS Dimethyl sulfate in particulate matter from coal-	
and oil-fired power plants	
p0005 A82-16199	1
Flame-retention head burner efficiency test	
results and analysis: Space-heating-equipment	
test program [DE81-030219] p0093 N82-10153	
Workshop proceedings: Combustion Turbine Residual	•
Oil	
[EPRI-WS-80-132] p0103 N82-11261	
Coal-oil mixtures: An alternative fuel for the	
commercial markets and large residential markets [DE81-028335]	
[DE81-028335] p0114 N82-14379 Thermochemical production of liquids from biomass	
[DE81-030085] p0117 N82-15226	
PUBL PRODUCTION	,
Puel for future transport aircraft	
Fuel for future transport aircraft [ASBE PAPEE 81-HT-80] p0089 A82-10965	
Puel for future transport aircraft	,

```
Enthanol fuels from biomass projects
                                               p0089 A82-11837
   Production of synthetic crude oil from coal using
      the TOSCOAL pyrolysis process
                                               D0090 A82-11849
   Biomass resources for alcohol fuels
                                               p0090 A82-12533
   Feasibility of solar assisted ethanol production
      [AIAA PAPER 81-2533]
                                               p0054 A82-14004
   Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants
      [AIAA PAPER 81-2547]
                                               p0128 A82-14012
   Puels from bicmass and wastes --- Book
                                               p0091 A82-14986
   Fuel and energy --- Book
                                               p0004 A82-15589
   Biomass conversion processes for energy and fuels
      --- Book
                                               D0092 A82-18114
   Selectivity in Fischer-Tropsch synthesis: Review
      and recommendations for further work
      [PB81-223596]
                                               p0095 N82-10271
   Advanced system experimental facility:
                                                  Solid
      waste to methane gas. Background and process
      description
      [DE81-030198]
                                              D0101 N82-11244
   Pusion as a source of synthetic fuels
     [BNL-29281]
                                               p0086 N82-11257
   Environmental research plan for gas supply technologies. Volume 2: Environmental research
      plan
      [ PB81-222317]
                                               p0011 N82-11274
   Engineering challenges of fusion-reactor development
                                              p0139 N82-11907
     [DE81-024129]
   The severity of institutional barriers affecting
      energy-from-municipal-waste technologies [DE82-000133] p0018
                                              p0018 N82-12583
   Controlled-flash pyrolysis
     [DE82-000284]
                                               p0111 N82-13196
   Low/medium Btu coal gasification assessment
      program for potential users in New Jersey:
      Executive summary
      [ DB81-025475]
                                               D0111 N82-13247
   Feasibility study report for the Imperial Valley
      Ethanol Refinery: A
14.9-million-gallon-per-year ethanol synfuel
   refinery utilizing geothermal energy [DE82-000288] p0112 N82 Creating a safer environment in US coal mines:
                                               p0112 N82-13252
      The Bureau of Mines Methane Control Program,
      1964-79
      [PB81-233918]
   Solar-central-receiver fuels and chemicals
   [DB82-000941] p0077 I
Alcohol fuels grant program at Lincoln Land
Community College, Springfield, Illinois
                                              p0077 N82-13530
      [DE82-000744]
                                               p0114 N82-14375
   Feasibility study for an alcohol-fuels plant for
     Buffalo, New York [DE82-000032]
   [DE82-000032]
Fuels and chemicals made from solar energy p0077 N82-14384
                                               p0114 N82-14377
   Energy balance and utilization of agricultural
      waste on a farm
      [PB81-229262]
                                               p0115 N82-14385
   Education and training implications of biomass
     energy system use [DE81-029956]
                                               D0028 N82-14664
   Fuels and electric energy consumed
[PB81-240442]
POBL POMPS
                                               p0032 N82-15594
   A LH2 engine fuel system on board - Cold GH2
      injection into two-stroke engine with LH2 rump
      [ASME PAPER 81-HT-81]
                                               p0083 A82-10966
PURL TRSTS
   Optimization of the composition and antidetonation
     properties of AI-93 gasoline
   Low/medium Btu coal gasification assessment program for potential users in New Jersey:
     Executive summary [DE81-025475]
                                               p0111 N82-13247
PUBLS
   Experimental evaluation of the steady-state and
     dynamic performance characteristics of the interactive units of a coal-gasification process
     [DE81-028995]
                                              p0094 N82-10259
   Thermophysical properties of coal liquids [DE81-0279446] p009
                                               p0097 N82-10938
```

Chemistry and catalysis of coal liquefaction:	GAS COMPOSITION
Catalytic and thermal upgrading of coal liquid	Characteristics of combustion and pollutant
and hydrogenation of CO to produce fuels	formation in swirling flames
[DOE/ET-14700/1] p0102 N82-11259	p0001 A82-10875
Chemistry and catalysis of coal liquefaction:	GAS COOLING
Catalytic and thermal upgrading of coal liquid	Gas cooled solar power plant for generating
and hydrogenation of CO to produce fuels	electrical energy in the 20MWe operating range
[DOE/ET-14700/2] p0102 B82-11260	(GAST): Preliminary design phase
MASEC industrial fuel-wood program	[BMFT-FB-T-81-097] p0080 N82-15530
[DE82-000461] p0110 N82-12595	GAS DISCEARGES
Biomass energy utilization in the Pacific	Ionization waves in an argon discharge in a
Northwest: Impacts associated with residential	longitudinal gas flow . p0127 A82-12666
use of solid fuels	
[DE81-029137] p0115 N82-14383	GAS DISSOCIATION
PUNCTIONAL DESIGN SPECIFICATIONS	An experimental study of SO3 dissociation as a
Residual-energy-application program: BAST	mechanism for converting and transporting solar
facility requirements document, volume 1	energy
[DE81-027536] p0142 B82-13526	p0043 A82-11214
Purans	Small-scale uses and costs of hydrogen derived
Thermolysis of naphthols	from OTEC ammonia
[DE81-029684] p0116 B82-15152	p0084 A82-11792
FURNACES	Brayton cycle using dissociating nitrosyl chloride
Real-time coarse-particle mass measurements in a	p0126 A82-11852
high-temperature/pressure coal-gasifier process	GAS BVOLUTION
treatment	Outgassing of two synthetic fuels
[DE81-030039] p0119 N82-15604	[AD-A104580] p0100 N82-11231
	GAS PLOW
Assessment of the long-range transport of	
residential woodstove fine-particulate emissions	Controlled Retracting Injection Point (CRIP)
for two future United States energy scenarios	system: A modified-stream method for in situ
[DE81-030096] p0033 N82-15613	coal gasification
PUSION REACTORS	[DE81-026477] p0102 N82-11248
Engineering challenges of fusion-reactor development	Proceedings: Symposium on Plue Gas
[DE81-024129] p0139 N82-11907	Desulfurization, volume 2
Progress report to the Department of Energy in	[PB81-243164] p0035 N82-15652
support of basic energy and policy research	GAS INJECTION
[DE81-025882] p0028 N82-14648	A LH2 engine fuel system on board - Cold GH2
[220. 023002]	injection into two-stroke engine with LH2 rump
	[ASME PAPER 81-HT-81] p0083 A82-10966
G	Controlled Retracting Injection Point (CRIP)
CATTIPO CDACPCDAPT	
GALILEO SPACECRAFT	system: A modified-stream method for in situ
Engineering development testing of the GPHS-RTG	coal gasification
converter General Purpose Heat	[DE81-026477] p0102 N82-11248
Source-Radioisotope Thermoelectric Generator for	GAS LASERS
Galileo orbiter power supply	A solar simulator-pumped gas laser for the direct
p0122 A82-11752	conversion of solar energy
Nuclear electric power for space systems -	p0044 A82-11710
Technology background and flight systems program	Advanced solar energy conversion solar pumped
Technology background and flight systems program p0123 A82-11756	Advanced solar energy conversion solar pumped gas lasers
p0123 A82-11756	gas lasers
GALLIUM ARSENIDE LASERS p0123 A82-11756	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obuic contact p0041 A82-10776	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obbic contact p0041 A82-10776 GALLIUM ARSENIDES	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification p0089 A82-11848
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Ohmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification p0089 A82-11848 GAS RECOVERY
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obsic contact p0041 A82-10776 GALLIUM ABSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification p0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Ohmic contact p0041 AB2-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS BEACTORS An overview of peat gasification p0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obuic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HINTORES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Ohmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTORES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS ERACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTORES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS ERACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ABSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical wapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTORES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS EBACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-22291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-22291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills
p0123 A82-11756 GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films Gallium-arsenic-antimony heterojunction photocells p0055 A82-13803 Gallium-arsenic-antimony heterojunction cells -	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells Models for the functioning, experimentation, and	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTORES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS ERACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-22309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 H82-12584 Development of a metal hydride process for
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obuic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films Gallium-arsenic-antimony heterojunction photocells p0055 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P1089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Ohmic contact P0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space P0046 A82-11765 GaAs solar cells for space application P0046 A82-11766 High efficiency thin-film GaAs solar cells P0049 A82-11767 Advanced Satellite Power System /SFS/ concept P0049 A82-11839 Thin-film gallium arsenide homojunction solar cells P0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films Gallium-arsenic-antimony heterojunction photocells P0055 A82-13803 Gallium-arsenic-antimony heterojunction cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obsic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTORES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS ERACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films Gallium-arsenic-antimony heterojunction photocells p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on the deep-level defects in 200 keV proton	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-22291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-22309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] Bigh-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P10089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Ohmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films Gallium-arsenic-antimony heterojunction photocells p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DB81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ABSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films Gallium-arsenic-antimony heterojunction photocells p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTORES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-22291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-22309] P0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques [PB81-240186] p0034 N82-15637
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films Gallium-arsenic-antimony heterojunction photocells p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells p0061 A82-18287 GAS CHROMATOGRAPHY Development and application of analytical	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] Bigh-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques [PB81-240186] p0034 N82-15637
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells p0061 A82-18287 GAS CHROMATOGRAPHY Development and application of analytical techniques to chemistry of donor solvent	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques [PB81-240186] p0034 N82-15637 GAS STREAMS Optical diagnostic techniques for coal-fired HHD
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells p0061 A82-18287 GAS CHROMATOGRAPHY Development and application of analytical techniques to chemistry of donor solvent liquefaction	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTORES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS ERACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-22291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques [PB81-240186] p0034 N82-15637 GAS STREMMS Optical diagnostic techniques for coal-fired MHD applications
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films Gallium-arsenic-antimony heterojunction photocells p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells p0061 A82-18287 GAS CHROMATOGRAPHY Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] p0099 N82-11166	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS HITTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification P0089 A82-11848 GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-22291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques [PB81-240186] p0034 N82-15637 GAS STERAMS Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obbic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of low temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells GAS CHROMATOGRAPHY Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] p0099 M82-11166 Oil spill identification by chemical analysis	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11247 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques [PB81-240186] p0034 N82-15637 GAS STERNES Optical diagnostic techniques for coal-fired MHD applications [ATAA PAPER 82-0377] p0135 A82-17913
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obmic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films Gallium-arsenic-antimony heterojunction photocells p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of lcw temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells p0061 A82-18287 GAS CHROMATOGRAPHY Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] p0099 N82-11166	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS NITURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11247 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DB81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques [PB81-240186] p0034 N82-15637 GAS STREAMS Optical diagnostic techniques for coal-fired MED applications [ATAA PAPER 82-0377] p0135 A82-17913 GAS TEBPERATURE Correlation between results of zone method and
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obbic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of low temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells GAS CHROMATOGRAPHY Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] p0099 M82-11166 Oil spill identification by chemical analysis	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS MIXTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DR81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DR81-02600] p0067 N82-11247 Gas recovery from coal deposits [PR81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PR81-222299] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DR82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DR81-022685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DR81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques [PR81-240186] p0034 N82-15637 GAS STRRAMS Optical diagnostic techniques for coal-fired MBD applications [AIAA PAPER 82-0377] p0135 A82-17913 GAS TRREPERATURE Correlation between results of zone method and experiment in radiative heat transfer
GALLIUM ARSENIDE LASERS Laser bonded n-GaAs/p-GaSb heterojunction intercell Obbic contact p0041 A82-10776 GALLIUM ARSENIDES Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 GaAs solar cells for space application p0046 A82-11766 High efficiency thin-film GaAs solar cells p0046 A82-11767 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films p0053 A82-13803 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Effects of low temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells GAS CHROMATOGRAPHY Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] p0099 M82-11166 Oil spill identification by chemical analysis	gas lasers [NASA-CR-165060] p0079 N82-15526 GAS NITUTURES The corrosion of some superalloys in contact with coal chars in coal gasifier atmospheres p0091 A82-17974 GAS REACTORS An overview of peat gasification GAS RECOVERY Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Solar coal-gasification reactor for hydrocarbon-free synthesis gas [DE81-026600] p0067 N82-11247 Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 N82-11657 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Development of a metal hydride process for hydrogen recovery from supplemented natural gas [DE81-02685] p0086 N82-14382 High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 Potential environmental problems of enhanced oil and gas recovery techniques [PB81-240186] p0034 N82-15637 GAS STREAMS Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913 GAS TEMPERATURE Correlation between results of zone method and

SUBJECT INDEX GEOSYNCHRONOUS ORBITS

Control of utility boiler and gas turbine	GASOLIBE
	Aviation gasoline versus automotive gasoline [AIAA PAPER 81-1705] p0091 A82-14395
pollutant emissions by combustion modification, phase 2	Evaporative hydrocarbon emissions from a large
[PB81-222267] p0015 N82-11654	vehicle population
GAS TURBINE ENGINES	p0004 A82-14442
The AGT101 technology - An automotive alternative p0123 A82-11783	Optimization of the composition and antidetonation properties of AI-93 gasoline
Coal fired air turbine cogeneration	p0091 A82-15722
P0089 A82-11836	Selectivity in Pischer-Tropsch synthesis: Review
Ceramics for the AGT101 automotive gas turbine	and recommendations for further work
p0132 A82-16827 Baseline data on utilization of low-grade fuels in	[PB81-223596] p0095 N82-10271 Impact of fuel-economy shortfall: Trends in
gas turbine applications. Volume 3: Emissions	technology-weighted EPA versus on-road MPG.
evaluation	Periodic analysis memorandum no. 1
[DE81-903764] p0006 N82-10254	[DB81-030841] p0020 N82-12667
AGT-102 automotive gas turbine [NASA-CR-165353] p0140 N82-12444	Motor gasolines, winter 1980-81 [DE81-030845] p0117 N82-15224
[NASA-CR-165353] p0140 N82-12444 Low NO sub x heavy fuel combustor concept program	Pollution of the soil by aviation gasoline
[NASA-CR-165512] p0140 N82-12572	[FML-1979-41] p0032 N82-15596
Development of a high-temperature durable catalyst	Heavy-duty engine baseline program and NO sub x
for use in catalytic combustors for advanced automotive gas turbine engines	emission standard development (1972-73) [PB81-244030] p0034 N82-15621
[NASA-CR-165396] p0142 N82-13510	GELATION
External fuel vaporization study	Study of gelled LNG
[NASA-CR-165513] P0114 N82-14371	[DE81-023259] p0095 N82-10269
GAS TURBINES Thermionic combustor application to combined gas	GEOCHEMISTRY Development of organic geochemical and isotope
and steam turbine power plants	techniques for hydrocarbon exploration
p0124 A82-11818	[BMFI-FB-T-80-076] p0097 N82-10482
Baseline data on utilization of low-grade fuels in	Geophysical survey, Paso Robles geothermal area,
gas turbine applications. Volume 2: Hot component corrosion evaluation	California, part of the resource assessment of low- and moderate-temperature geothermal
[DE81-903760] p0094 N82-10253	resource areas in California
Water-cooled gas turbine development program	[DE81-026038] p0109 N82-12517
[DE81-904245] p0136 N82-10406	Evaluation of Devonian shale potential in eastern
Workshop proceedings: Combustion Turbine Residual Oll	Kentucky/Tennessee [DB82-001164] p0116 N82-14595
FRRT-WS-80-1321 p0103 N82-11261	Exploratory study of coal-conversion chemistry
Control of utility boiler and gas turbine	[DE81-016136] p0119 N82-15552
pollutant emissions by combustion modification,	GEOCHRONOLOGY
phase 2 [PB81-222267] p0015 N82-11654	Development of peatlands in northern Minnesota [DE82-000873] p0112 N82-13475
Evaluation of shale oil as a utility gas-turbine	Stratigraphy and depositional history of the Iola
fuel	Limestone Upper Pennsylvanian (Missourian),
[DE81-904234] p0107 N82-12251	Northern Midcontinent U.S.
Investigation and research of specific combustion-turbine and combined-cycle field	GEOLOGICAL PAULTS . p0116 N82-14711
_	Geomagnetic and magnetotelluric soundings in the
problems	deducing and magnetoterrated boundings in the
[DE81-904231] p0141 N82-12592	area of the Central European rift system
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts.	area of the Central European rift system [BMFT-FB-T-81-111] p0119 N82-15656
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices	area of the Central European rift system
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYMANIC LASERS	area of the Central European rift system [BMFT-FB-T-81-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYMANIC LASSES Ionization waves in an argon discharge in a	area of the Central European rift system [BMFT-FB-T-81-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argon discharge in a longitudinal gas flow	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYMANIC LASSES Ionization waves in an argon discharge in a	area of the Central European rift system [BMFT-FB-T-81-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYMANIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary	area of the Central European rift system [BMFT-FB-T-81-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier	area of the Central European rift system [BHTT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow P0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier P0146 A82-17127	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYMANIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Feasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argon discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Hontana	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden,
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argon discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow P0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier P0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254 GASIFICATION	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden,
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argon discharge in a longitudinal gas flow p0127 N82-12666 GASEOUS FURLS The significance of hydrogen as future secondary energy carrier p0146 N82-17127 Feasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254 GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Feasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594
Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow GASEOUS FUELS The significance of hydrogen as future secondary energy carrier Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] Peat biogasification development program	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Feasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272 Peat biogasification development program [DE81-028299] p0101 N82-11243 Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S.
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254 GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272 Peat biogasification development program [DE81-028299] p0101 N82-11243 Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 Environmental research plan for gas supply	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S.
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254 GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [P881-217614] p0095 N82-10272 Peat biogasification development program [DE81-028299] p0101 N82-11243 Transportation fuels from synthetic gas [DE81-029614] Environmental research plan for gas supply technologies. Volume 2: Environmental research	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S.
Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argcn discharge in a longitudinal gas flow P0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier P0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272 Peat biogasification development program [DE81-028299] p0101 N82-11243 Transportation fuels from synthetic gas [DE81-029614] Environmental research plan [PB81-222317] p0011 N82-11274	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S. p0116 N82-14711 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011]
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argen discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Feasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254 GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272 Peat biogasification development program [DE81-028299] p0101 N82-11243 Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 Environmental research plan for gas supply technologies. Volume 2: Environmental research plan [PB81-222317] p0011 N82-11274 Sulfur pollution control. Phase 1: The disposal	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Haine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S. p0116 N82-14711 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming: Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489
Update on Specified European R and D Efforts. Part 1: Appendices [DR81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argon discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FURLS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254 GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272 Peat biogasification development program [DE81-028299] p0101 N82-11243 Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 Environmental research plan for gas supply technologies. Volume 2: Environmental research plan [PB81-222317] p0011 N82-11274 Sulfur pollution control. Phase 1: The disposal program (sections 5 through 7)	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S. Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] gBOMETRICAL OPTICS Geometrical optical performance studies of a
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argen discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Feasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254 GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272 Peat biogasification development program [DE81-028299] p0101 N82-11243 Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 Environmental research plan for gas supply technologies. Volume 2: Environmental research plan [PB81-222317] p0011 N82-11274 Sulfur pollution control. Phase 1: The disposal	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Haine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S. p0116 N82-14711 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming: Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489
[DE81-904231] p0141 N82-12592 Update on Specified European R and D Efforts. Part 1: Appendices [DE81-026404] p0143 N82-13983 GASDYNAMIC LASERS Ionization waves in an argen discharge in a longitudinal gas flow p0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier p0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254 GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272 Peat biogasification development program [DE81-028299] p0101 N82-11243 Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 Environmental research plan for gas supply technologies. Volume 2: Environmental research plan [PB81-222317] p0011 N82-11274 Sulfur pollution control. Phase 1: The disposal program (sections 5 through 7) [PB81-222804] p0015 N82-11655 GASOHOL (FUEL) Ethanol production in southern tier east region of	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-02642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026442] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S. p0116 N82-14711 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] GBONETHICAL OPTICS Geometrical optical performance studies of a composite parabolic trough with a fin receiver p0043 A82-11390 GBOSYNCHRONOUS ORBITS
Update on Specified European R and D Efforts. Part 1: Appendices [DB81-026404] GASDYNAMIC LASERS Ionization waves in an argon discharge in a longitudinal gas flow P0127 A82-12666 GASROUS FURLS The significance of hydrogen as future secondary energy carrier P0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Hontana [DE81-030622] GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] Peat biogasification development program [DE81-028299] Transportation fuels from synthetic gas [DE81-029614] Environmental research plan for gas supply technologies. Volume 2: Environmental research plan [PB81-222317] Sulfur pollution control. Phase 1: The disposal program (sections 5 through 7) [PB81-222804] GASOHOL (FUEL) Ethan ol production in southern tier east region of New York: Technical and economic feasibility	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S. Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] g0118 N82-15489 GEOMETRICAL OPTICS Geometrical optical performance studies of a composite parabolic trough with a fin receiver p0043 A82-11390 GEOSYNCHRONOUS ORBITS Transportation systems and cost comparison for
Update on Specified European R and D Efforts. Part 1: Appendices [DB81-026404] GASDYNAMIC LASERS Ionization waves in an argon discharge in a longitudinal gas flow P0127 A82-12666 GASEOUS FUELS The significance of hydrogen as future secondary energy carrier P0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] Peat biogasification development program [DE81-028299] Transportation fuels from synthetic gas [DE81-029614] Environmental research plan for gas supply technologies. Volume 2: Environmental research plan [PB81-222317] Sulfur pollution control. Phase 1: The disposal program (sections 5 through 7) [PB81-222804] GASOHOL (FUEL) Ethanol production in southern tier east region of New York: Technical and economic feasibility [PB81-226979] D011 N82-11275	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GEOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S. p0116 N82-14711 Geologic applications of thermal-inertia mapping from satellite Powder River, Myoming; Cubeza Prieta, Arizona, and Yellowstone National Park [B2-10011] p0118 N82-15489 GEOMETRICAL OPTICS Geometrical optical performance studies of a composite parabolic trough with a fin receiver p0043 A82-11390 GEOSYNCHROHOUS ORBITS Transportation systems and cost comparison for launching an SPS into geosynch. orbit
Update on Specified European R and D Efforts. Part 1: Appendices [DB81-026404] GASDYNAMIC LASERS Ionization waves in an argon discharge in a longitudinal gas flow P0127 A82-12666 GASROUS FURLS The significance of hydrogen as future secondary energy carrier P0146 A82-17127 Peasibility and economic study of medium-Btu coal gas blended with high-Btu by-product gas as an industrial energy source at Billings, Hontana [DE81-030622] GASIFICATION Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] Peat biogasification development program [DE81-028299] Transportation fuels from synthetic gas [DE81-029614] Environmental research plan for gas supply technologies. Volume 2: Environmental research plan [PB81-222317] Sulfur pollution control. Phase 1: The disposal program (sections 5 through 7) [PB81-222804] GASOHOL (FUEL) Ethan ol production in southern tier east region of New York: Technical and economic feasibility	area of the Central European rift system [BMFT-FB-T-61-111] p0119 N82-15656 GBOLOGICAL SURVEYS Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of low- and moderate-temperature geothermal resource areas in California [DE81-026038] p0109 N82-12517 Resource assessment of Low and Moderate-temperature geothermal waters in Calistoga, Napa County, California [DE81-025559] p0109 N82-12518 Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 Bibliography of publications dealing with tar sands [DE81-026146] p0115 N82-14594 Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian), Northern Midcontinent U.S. Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] g0118 N82-15489 GEOMETRICAL OPTICS Geometrical optical performance studies of a composite parabolic trough with a fin receiver p0043 A82-11390 GEOSYNCHRONOUS ORBITS Transportation systems and cost comparison for

GROTECHNICAL ENGINEERING	Geothermal environmental assessment: Behavior of
Plan for technological research and development	selected geothermal brine contaminants in plants
related to the petroleum activities on the	and soils
Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2.	[PB81-222333] p0015 N82-11671 Formation evaluation in liquid-dominated
Research requirements. 3. High priority programs	qeothermal reservoirs
[DE81-904014] p0104 N82-11520	[DOB/ET-28384/T1] p0109 N82-12514
Reservoir stability studies ,	Geothermal reservoir assessment: Northern basin
[DE81-030099] p0160 N82-15510	and range province Stillwater prospect,
GEOTEMPERATURE	Churchill County, Nevada
Investigation of direct expansion in ground source	[DE82-000529] p0109 N82-12516
heat pumps	Geophysical survey, Paso Robles geothermal area,
[DE81-024139] p0012 N82-11418	California, part of the resource assessment of
GEOTHERNAL ENERGY CONVERSION	low- and moderate-temperature geothermal
Applications of thermoelectrics to geothermal	resource areas in California
energy conversion	[DE81-026038] p0109 N82-12517
p0125_A82-11824	Resource assessment of Low and
Alternative ocean energy products and hybrid	Moderate-temperature geothermal waters in
geothermal-OTEC /GEOTEC/ plants	Calistoga, Napa County, California [DE81-025559] p0109 N82-12518
[AIAA PAPER 81-2547] p0128 A82-14012	[DE81-025559] p0109 N82-12518 Heat flow studies and geothermal exploration in
Hot dry rock geothermal energy development program [LA-UR-81-1265] p0097 N82-10560	western Trans-Pecos Texas
Water-related constraints to the development of	p0110 N82-12684
qeothermal electric generating stations	Feasibility study report for the Imperial Valley
[DE81-025138] p0007 N82-10561	Ethanol Refinery: A
Analysis of thermal/mechanical energy-conversion	14.9-million-gallon-per-year ethanol synfuel
concepts	refinery utilizing geothermal energy
[DE81-027854] p0139 N82-11585	[DE82-000288] p0112 N82-13252
Geothermal reservoir assessment: Northern basin	Geothermal-resource verification for Air Force Bases
and range province Stillwater prospect,	[DE81-027482] p0112 N82-13520
Churchill County, Nevada	Accessing the geothermal resources
[DE82-000529] p0109 N82-12516	[DE81-025396] p0116 N82-14614
Workshop proceedings: U-bend tube cracking in	Geologic applications of thermal-inertia mapping
steam generators	from satellite Powder River, Wyoming; Cubeza
[DE81-903765] p0142 N82-13515	Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489
New and renewable energy in the United States of America	[E82-10011] p0118 N82-15489 Structural evolution of three
[DE81-030887] p0024 N82-13539	qeopressured-qeothermal areas in the Texas Gulf
Sandia program in geothermal technology development	Coast
[DE81-025394] p0119 N82-15546	[DE81-029799] p0118 N82-15505
GEOTHERMAL ENERGY EXTRACTION	Sampling and analysis of potential geothermal sites
Development of man-made geothermal reservoirs	[PB81-240061] p0119 N82-15593
extracting heat from hot dry rock	Geomagnetic and magnetotelluric soundings in the
[LA-UR-81-852] p0097 N82-10480	area of the Central European rift system
Relaxation of geothermal-reservoir stresses	[BMFT-FB-T-81-111] p0119 N82-15656
induced by heat production	Schlumberger resistivity study of the Jemez
[DE81-032024] p0105 N82-11715	Springs region of northwestern New Mexico
Accessing the geothermal resources	[DE81-025302] p0119 N82-15661
[DE81-025396] p0116 N82-14614	GRAD: A tool for program analysis and progress
Sampling and analysis of retential geothermal sites [PB81-240061] p0119 N82-15593	monitoring [DE81-028098] p0120 N82-15981
GEOTHERMAL ENERGY UTILIZATION	GEOTHERMAL TECHNOLOGY
Energy technologies and the environment.	Geothermal systems: Principles and case histories
Environmental information handbook	Book
[DE81-029809] p0020 N82-12660	p0090 A82-12275
Feasibility study report for the Imperial Valley	Value tree analysis of energy supply alternatives
Ethanol Refinery: A	[AD-A105629] p0029 N82-14875
14.9-million-gallon-per-year ethanol synfuel	Sandia program in geothermal technology development
refinery utilizing geothermal energy	[DE81-025394] p0119 N82-15546
[DB82-000288] p0112 N82-13252	GERMANIUM
GEOTHERNAL BESOURCES	
	Electrical characteristics of high-voltage
Reduced heat flow - Mean heat flow relationship	germanium photoconverters under high
for the continental geothermal provinces	<pre>germanium photoconverters under high illumination intensities</pre>
for the continental geothermal rrownnces p0089 A82-10372	germanium photoconverters under high iilumination intensities p0040 A82-10391
for the continental geothermal provinces p0089 A82-10372 One-dimensional model of vapor-dominated	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and
for the continental geothermal rrowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters
for the continental geothermal provinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033	germanium photoconverters under high illumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422
for the continental geothermal rrowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems	germanium photoconverters under high illumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS
for the continental geothermal provinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated	germanium photoconverters under high illumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422
for the continental geothermal provinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass
for the continental geothermal provinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] p0093 N82-10201 Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209
for the continental geothermal provinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [DE81-028312] Low-to-moderate temperature geothermal resource	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [DE81-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS PIBERS
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [DE81-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [DE81-030487] p0096 N82-10475	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] D096 N82-10366 Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [DE81-030487] Montana geothermal handbock: A guide to agencies,	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS PIBERS Conceptual design of a glass-reinforced concrete solar collector
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [DE81-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [DE81-030487] Montana geothermal handbock: A guide to agencies, regulations, permits and financial aids for	germanium photoconverters under high iilumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] p0065 N82-10542
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [DE81-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [DE81-030487] Montana geothermal handbook: A guide to agencies, regulations, permits and financial aids for geothermal development	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete solar collector [DEB1-029280] p0065 N82-10542 GLOW DISCHARGES
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Flow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [DE81-030487] Montana geothermal handbock: A guide to agencies, regulations, permits and financial aids for geothermal development [DE81-024315] p0007 N82-10562	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS PIBERS Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] p0065 N82-10542 GLOW DISCHARGES Introduction to basic aspects of plasma-deposited
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Flow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [DE81-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [DE81-030487] Montana geothermal handbock: A guide to agencies, regulations, permits and financial aids for geothermal development [DE81-024315] NOOT N82-10562 INEL goethermal environmental program	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete solar collector [DEB1-029280] p0065 N82-10542 GLOW DISCHARGES
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [DE81-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [DE81-030487] Montana geothermal handbock: A guide to agencies, regulations, permits and financial aids for geothermal development [DE81-024315] p0007 N82-10562 INEL goethermal environmental program	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] p0065 N82-10542 GLOW DISCHARGES Introduction to basic aspects of plasma-deposited amorphous semiconductor alloys in photovoltaic
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [D881-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [D881-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [D881-030487] Montana geothermal handbcck: A guide to agencies, regulations, permits and financial aids for geothermal development [D881-024315] INEL goethermal environmental program [D881-025671] p0008 N82-10591	germanium photoconverters under high iilumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] p0065 N82-10542 GLOW DISCHARGES Introduction to basic aspects of plasma-deposited amorphous semiconductor alloys in photovoltaic conversion
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [p281-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [p281-028312] p0096 N82-10366 Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [p281-030487] Montana geothermal handbock: A guide to agencies, regulations, permits and financial aids for geothermal development [p281-024315] p0007 N82-10562 INEL goethermal environmental program [p281-025671] Techniques for geothermal liquid sampling and analysis [p381-030151] p0098 N82-11149	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] p0065 N82-10542 GLOW DISCHARGES Introduction to basic aspects of plasma-deposited amorphous semiconductor alloys in photovoltaic conversion p0039 A82-10026 GOVERNMENT/INDUSTRY RELATIONS Solar explosion
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [D881-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [D881-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [D881-030487] Montana geothermal handbcck: A guide to agencies, regulations, permits and financial aids for geothermal development [D881-024315] INEL goethermal environmental program [D881-025671] Techniques for geothermal liquid sampling and analysis [D881-030151] Two-phase flow in geothermal energy sources	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] p0065 N82-10542 GLOW DISCHARGES Introduction to basic aspects of plasma-deposited amorphous semiconductor alloys in photovoltaic conversion p0039 A82-10026 GOVERNMENT/INDUSTRY RELATIONS Solar explosion [DE81-026086] p0074 #82-12628
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [DE81-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [DE81-030487] Montana geothermal handbock: A guide to agencies, regulations, permits and financial aids for geothermal development [DE81-024315] INEL goethermal environmental program [DE81-025671] Techniques for geothermal liquid sampling and analysis [DE81-030151] Two-phase flow in geothermal energy sources [DE81-029037] Total members of pounds and pounds poun	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] p0065 N82-10542 GLOW DISCHARGES Introduction to basic aspects of plasma-deposited anorphous semiconductor alloys in photovoltaic conversion p0039 A82-10026 GOVERNMENT/INDUSTRY RELATIONS Solar explosion [DE81-026086] p0074 N82-12628 The Seasat commercial demonstration program
for the continental geothermal frowinces p0089 A82-10372 One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Corrosion testing of carbon steel in aereated geothermal brine [D881-028653] Plow in geothermal wells. Part 4: Transition criteria for two-phase flcw patterns [D881-028312] Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [D881-030487] Montana geothermal handbcck: A guide to agencies, regulations, permits and financial aids for geothermal development [D881-024315] INEL goethermal environmental program [D881-025671] Techniques for geothermal liquid sampling and analysis [D881-030151] Two-phase flow in geothermal energy sources	germanium photoconverters under high inlumination intensities p0040 A82-10391 Cascade photogenerators based on silicon and germanium matrix photoconverters p0044 A82-11422 GLASS Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 GLASS COATINGS Analysis of the optical characteristics of solar collectors p0052 A82-13715 GLASS FIBERS Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] p0065 N82-10542 GLOW DISCHARGES Introduction to basic aspects of plasma-deposited amorphous semiconductor alloys in photovoltaic conversion p0039 A82-10026 GOVERNMENT/INDUSTRY RELATIONS Solar explosion [DE81-026086] p0074 #82-12628

GOVERNMENTS	HAULIEG
Building a consensus about energy technologies	Extensible bridge-conveyor concepts for coal-mine
[DE82-000501] p0024 N82-13536 GRAIN BOUNDARIES	face haulage [DE81-031974] p0146 N82-12525
The optimization of solar conversion devices	Environmental impacts of energy transportation
p0039 A82-10025	[DE82-900316] p0025 N82-13559
Grain size dependence of the photovoltaic properties of solar grade polysilicon	Possible use of coal in Hawaii, 1980 - 2000
p0057 A82-16051	[DE81-028266] p0010 N82-11263
Effects of heat treatment on epitaxial silicon	HAZARDS
solar cells on metallurgical silicon substrates	Environmental assessment of the Alaskan
p0058 A82-16469 GRAVITATION	Continental Shelf: Annual reports of principal investigators for the year ending March 1980.
Theoretical analysis of the performance of a	Volume 5: Hazards
gravity-controlled sclar concentrator	[PB81-225732] p0026 N82-13607
p0050 A82-12812 GREAT PLAIRS CORRIDOR (NORTH AMERICA)	HEALTH PHYSICS Health and safety research division
Great Plains gasification project, Mercer County,	[DE81-026088] p0026 N82-13652
North Dakota; water assessment report section	HEAT BALANCE
13 (c) [PB81-216111] p0013 N82-11524	Theoretical basis of the DOE-2 building energy use analysis program
Great Plains gasification project, Mercer County,	[DE81-028896] p0030 N82-15242
North Dakota; water assessment report	HEAT EXCHANGERS
[PB81-216129] p0013 N82-11525	Heat Transfer - Milwaukee 1981; Proceedings of the
GROUND STATIONS Coherent multiple tone technique for ground based	Twentieth National Heat Transfer Conference, Milwaukee, WI, August 2-5, 1981
SPS phase control	p0 145 A82-10806
p0147 N82-12546	Measured performance of falling-jet flash
GROUND WATER Fracture flow of groundwater in coal-bearing strata	evaporators [DE81-024355] p0161 N82-10565
[DE81-023810] p0096 N82-10479	High-temperature counter-flow recuperator
Review of simulation techniques for Aguifer	[DE81-031923] p0017 N82-12424
Thermal Energy Storage (ATES) [DE81-029943] p0156 N82-10532	External fuel vaporization study
[DE81-029943] p0156 N82-10532 LLNL underground coal gasification project	[NASA-CR-165513] p0114 N82-14371 US ceramic heat exchanger technology: Status and
[DE81-030634] p0103 N82-11267	opportunities
Coal liquefaction demonstration plant near	[DE81-029686] p0030 N82-15210
Morgantown, West Virginia; water assessment report section 13(b)	Rotating regenerative heat exchanger for energy recovery in chemical plants
[PB81-216095] p0103 N82-11269	[BMFT-FB-T-81-099] p0030 N82-15367
Coal liquefaction demonstration plant near	MHD oxidant intermediate temperature ceramic
Morgantown, West Virginia: Water assessment report	heater study
[PB81-216103] p0011 N82-11270	[NASA-CR-165453] p0144 N82-15527 Overview and FY 1981 progress on open-cycle OTEC
Resource assessment of Low and	power systems
Moderate-temperature geothermal waters in	[DE81-029277] p0144 N82-15580
Calistoga, Napa County, California [DE81-025559] p0109 N82-12518	HEAT PLUX H-Coal product physical properties measurement
Assessment of water supply contamination due to	[DE81-029095] p0111 N82-13245
underground coal gasification	HEAT MEASUREMENT
[PB81-209215] p0021 N82-12680 Environmental and radiclogical safety studies:	Enthalpy measurement of coal-derived liquids [DE81-029481] p0097 N82-10939
Interaction of (238) PuO2 heat sources with	HEAT OF COMBUSTION
terrestrial and aquatic environments	Characteristics of CVD silicon carbide thermionic
[DE81-032019] p0025 N82-13565 Effects of coal fly-ash disposal on water quality	converters p0124 A82-11821
in and around the Indiana Dunes National	Electric and hybrid vehicle environmental control
Lakeshore, Indiana	subsystem study
[PB81-238479] p0034 N82-15624 GROUND WIND	[NASA-CE-164996] p0020 N82-12658 HEAT OF FUSION
Network wind power over the Pacific northwest.	Thermal storage in salt-hydrates
Appendix 1: Wind statistics summaries for the	p0 153 A82-10018
wind power data stations [DE81-029291] p0112 N82-13518	Thermodynamic basis for selecting heat storage materials
Wind Power: Research on network wind power over	p0153 A82-10019
the Pacific northwest. Executive summary	HEAT OF VAPORIZATION
[DE81-029360] p0142 N82-13519 Application of Bayesian analysis for wind energy	A novel latent heat storage for solar space heating systems - Refrigerant storage
site evaluation	p0043 A82-11386
p0113 N82-13619	HEAT PIPES
GULF OF MEXICO Assessment of in-place solution methane in	Development of space reactor core heat pipes p0122 A82-11747
tertiary sandstones: Texas Gulf Coast	Heat pipes for NEP spacecraft radiators
[DE81-029772] p0117 N82-15225	p0122 A82-11748
	Effect of wick dryness on the performance of heat pipes with separate channels
H	p0005 A82-16272
HALL GENERATORS	High thermal power density heat transfer
Loading schemes for a 50 MW/th/ diagonally connected MHD generator	
*****	thermionic converters [NASA-CASP-IRE-12950-11
	thermionic converters [NASA-CASE-LEW-12950-1] p0139 N82-11399 Application of a gravity-driven wickless heat pipe
HANDBOOKS	[NASA-CASE-LEW-12950-1] p0139 N82-11399 Application of a gravity-driven wickless heat pipe for ice production in a cold energy storage system
HANDBOOKS Environmental compliance program handbook	[NASA-CASE-LEW-12950-1] p0139 N82-11399 Application of a gravity-driven wickless heat pipe for ice production in a cold energy storage system p0159 N82-13377
HANDBOOKS Environmental compliance program handbook [DE81-030226] p0008 N82-10585	[NASA-CASE-LEW-12950-1] p0139 N82-11399 Application of a gravity-driven wickless heat pipe for ice production in a cold energy storage system
HANDBOOKS Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Technology characterizations: Environmental information handbook, second edition	[NASA-CASE-LEW-12950-1] p0139 N82-11399 Application of a gravity-driven wickless heat pipe for ice production in a cold energy storage system p0159 N82-13377 Selection and testing of suitable coating systems for steel pipes used for long distance heat transfer
HANDBOOKS Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Technology characterizations: Environmental	[NASA-CASE-LEW-12950-1] p0139 N82-11399 Application of a gravity-driven wickless heat pipe for ice production in a cold energy storage system p0159 N82-13377 Selection and testing of suitable coating systems for steel pipes used for long distance heat

	De	velopm	ent o	fap	rotot	ype of a	10 kW	small	solar
						clogy to			nations 182-15532
e a	Ŧ	[BMFT-	FB-1-	01-10	, , ,			pooso	802-13332
			laten	t hea	tsto	rage for	solar	space	:
						rigerant			
						_			A82-11386
	Pr					the DOI	SHEE (D	OE Hea	t Pump
		Effici [DE81-			ram			n0007	N82-10551
	Aπ	nual c			V SVS	item		pood	802 10331
		[DE81-			1 -1-			p0007	N82-10552
	PI	elimin	ary i	ıvest	.igati	on on a	primar	y ener	gy
		saving	heat	supp	ly s	stem for	the r	esider	tial
		distri	ct "#	arıa	Linde	enhof" in Ver water	Dorst	en, We	st
		and sy	STATIS	enai	neeri	na water	. as a	neat s	ource
		[BMPT-				9		8000q	N82-10572
	Сy					nalysis	of abs	orptic	n heat
					heat	utilızat		04.00	
	ъ.	[DE81-			mi + m	c+nds fo			N82-11405
	Pd	heat-p				study fo	ir sora	r-g551	sceu
		[DE81-						p0067	N82-11407
	DC	E scla	r-ass	ıšted	heat	-ривр рі	ogram:	Its	
		evolut:	ion a	nd it	s pot	ential			
	<u>م</u> ۲	[DE81-				1.			N82-11413
	CB	[DE81-			Prog	ram: Ar			N82-11414
	Ιn				irect	expansi			
		heat p	umps			-			
		[DE81-	02413			٠.			N82-11418
	Чe				beat	pump Ile			ce study
	a r	[DE81-			-ton	gas-fire			N82-11419
	<i>.</i>					phase 2	u bput	•	
		[PB81-	223 37	2 j				p0139	N82-11478
	So	lar he			mulat	OF		- 0070	NOO 44500
	Dr	[DE81-			24101	of beat			N82-11583
	EL					-generat			
		[BAFT-	PB-T-	80-10	0]				N82-12403
	Aι					g pump		-0017	X 0 0 - 4 0 # 0 #
	50	[BMFT-]	Porf	OT MAD	ce fa	ctors fo	r acti	puul/ Ve sol	N82-12404
	50	system	s and	heat	-pump	systems	3		
		[DE81-	02856	9]					N82-12625
	Pu	el sav:	ings	in ho	t wat	er beati umps ope	ng fla	nts by	2+0221
		das (n	1 610 11	or n	eat p	cumps ope	Proje	ct: da	s engine
		FBMPT-	PB-T-	80-12	51			p0020	N82-12641
	Tb	e prop	ertie	s of	solar	and hea	t pump	heatı	.ng
				small	hous	es and a	dditio	nal he	at
		Source:						n0075	N82-12644
	E1			hybri	d veb	icles er			
		subsys	tem s	tudy					
	_	ΓNASA-	CR-16	49951		noin and		p0020	N82-12657
	ĽП	ergy co	OLSUD	pt101 ation	anal	ysis and sults fr	compa	t numr	: Study plants
		[BMPT-]	FB-T-	80 - 10	91	SULUS II			N82-15583
BA	Ŧ	RESIST	A THA	LLOYS					
	Tb	e corr	osion	of s	ome s	uperallo	ys in	contac	t with
		coal cl	nars	ın co	ат да	sifier a			A82-17974
	Mа	terial	s tec	hnolo	gy fo	or ccal-c			
		[DE81-							N82-11169
		SHIELD		_		_	_		_
	No	vel des	sign	of pr	essur	e vessel iers	s and	therma	.1
		SB1010:			yasıı	iers			N82-11474
		SOURCE:	5					-	
	En	gineer	ing d	evelo	rmen t	testing Purpose	of th	e GPBS	-RTG
						hermoele supply	CLTIC	етн г д	COL TOL
						1		p0122	A82-11752
	Ho	dular :	soto	pic t	hermo	electric	gener	ator	
	p -	TO 1	- + -	f =		. aca+1			A82-11753
						geother hot dry		PET A01	T2
		ILA-UR-	-81-8	521				p0097	N82-10480
	PĽ	elimina	ary i	nvēst	igatı	on on a	primar	y ener	gy
		saving	heat	supp	ly sy	stem for	the I	esiden	tial
						nhcf" in er water			
		and sys							
		[BMPT-				-		8000g	N82-10572

```
Investigation of direct expansion in ground source
     heat pumps [DE81-024139]
                                           p0012 N82-11418
   Assessment of the potential of coal-fueled heat
engines in total and integrated energy systems
     [DE82-000169]
                                           p0018 N82-12587
   Space nuclear safety and fuels program
                                           p0111 N82-12921
   Design and economics of direct-contact salt
     hydrate storage systems [SERI/TP-631-1163]
                                           p0160 N82-15558
HEAT STORAGE
   Corrosion science and its application to solar
     thermal energy material problems
                                           n0038 A82-10017
   Thermal storage in salt-hydrates
                                           p0153 A82-10018
   Thermodynamic basis for selecting heat storage
                                           p0153 A82-10019
   The application of reversible chemical reactions
     to solar thermal energy systems
                                           p0038 A82-10020
   A novel latent heat storage for solar space
heating systems - Refrigerant storage
                                           p0043 182-11386
   A spacecraft thermophotovoltaic power source with
     thermal storage
                                           p0044 A82-11711
   Molten salt thermal energy storage subsystem for
     Solar Thermal Central Receiver plants
                                           P0047 A82-11780
   Ground-mounted thermal storage for the parabolic
     dish solar collector/Stirling engine system
                                          p0047 A82-11781
   Aquifer thermal energy storage - A feasibility
     study for large scale demonstration
                                           p0154 A82-11846
   Buffer thermal energy storage for a solar Brayton
     engine
     [AIAA PAPER 81-2531]
                                           p0053 A82-14002
   A solar heating system with annual storage
                                           p0056 A82-15666
   Performance of a cylindrical phase change thermal
     energy storage unit [AIAA PAPER 82-0076]
                                           p0155 A82-17770
   Theoretical and numerical resolution of a
     mathematical model of the release of solar
     energy from storage
                                           p0061 A82-18232
   Solar project description for living systems
     single family residence, Davis, California
     [DE81-029743]
                                           p0064 N82-10511
   Review of simulation techniques for Aquifer
     Thermal Energy Storage (ATES)
                                           p0156 N82-10532
     [DE81-029943]
   State of the art in passive solar heating [LA-UR-81-2185] p006
                                           p0065 N82-10537
   Los Alamos National Laboratory Passive Solar Program
     [DE81-028778]
                                          p0065 N82-10538
   Controls for solar heating and cooling
     [DE81-025209]
                                           p0070 N82-11593
   Heat storage duration
    [ DE81-026635]
                                           p0070 N82-11602
   Guidebook for solar process-heat applications
     [ DE81-027977]
                                           p0072 N82-12598
   Solar project at Almeria nears completion
                                           p0075 N82-12647
   Electric and hybrid vehicles environmental control
     subsystem study
     [ NASA-CR-164995]
                                           p0020 N82-12657
   Solar thermal energy systems
     [DE81-029295]
                                           p0077 N82-13531
   Waste heat and chill storage in aquifer systems
     [DE81-028016]
                                           p0159 N82-14652
   Systems analysis of thermal storage
    [ DE81-030288]
                                           p0079 N82-14658
   Design and economics of direct-contact salt
    hydrate storage systems
    [SERI/TP-631-1163]
                                           p0160 N82-15558
   Comparative thermal performance of direct gain,
     Trombe, and sunspace walls
     [DE81-030546]
                                           p0081 N82-15571
   SERI Solar-Energy-Storage Program
     [DE81-029476]
                                           p0082 N82-15576
   Transwall: A modular visually transmitting thermal storage wall
     [DE81-029821]
                                           p0160 N82-15579
```

Ħ

H

H

H

SUBJECT INDEX HIGH ENERGY PURLS

Development of a modular heat exchanger with integrated latent heat energy store --- for The properties of solar and heat pump heating systems of small houses and additional heat solar heating applications [BMFT-FB-T-81-050] sources p0075 N82-12644 p0160 N82-15584 [VTT-56] Workshop proceedings: U-bend tube cracking in steam generators [DE81-903765] p0142 M82-BEAT TRANSPER Experimental investigation of parabolic-cylinder solar concentration with tubular heat receiver p0142 N82-13515 p0040 A82-10389 Passive/hybrid solar components: An approach to standard thermal test methods Heat Transfer - Milwaukee 1981; Proceedings of the [PB81-227886] Twentieth National Heat Transfer Conference, p0077 N82-13549 Coal-oil mixtures: An alternative fuel for the commercial markets and large residential markets [DB81-028335] p0114 N82-143 Milwaukee, WI, August 2-5, 1981 p0145 A82-10806 Boiling flow instability of a fixed mirror distributed focus solar receiver p0114 N82-14379 Pailure modes and effects analysis of a coal-slurry preheater D0041 A82-10810 p0117 N82-15221 Natural convection in air layers at various aspect [DE81-030425] Moorhead district heating, phase 2 [DE81-029689]
HEAVY LIFT LAUBCH VEHICLES ratios and angles of inclination p0058 A82-16249 p0031 N82-15556 Optimization of heat losses in normal and reverse Satellite power system: Concept development and evaluation program. Volume 7: Space flat-plate collector configurations - Analysis and performance transportation Water-related constraints to the development of [NASA-TM-58238-VOL-7] p0078 N82-14635 HELIOSTATS geothermal electric generating stations p0007 N82-10561 A central tower solar test facility /RM/CTSTF/ [DE81-025138] Heasured performance of falling-jet flash evaporators p0048 A82-11797 System of tolerances for a solar-tower power station p0053 A82-13717 [DE81-024355] Pluid-bed heat-exchanger optimization and bed The universal plane method for calculating the materials selection dimensions of heliostats [DOE/ET-11343/T2] p0104 M82-11 Jet impingement heat transfer enhancement for the p0104 N82-11571 p0062 A82-18697 Bconomic analysis of the unified heliostat array [DB81-026698] p0064 N82-10516 GPU-3 Stirling engine
[NASA-TM-82727] p0140 N82-11993 Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] Assessment of pulverized-coal-fired combustor performance p0065 N82-10542 Second generation heliostat, volume 1 [DE81-029618] p0105 N82-12187 [DE81-030860] p0069 N82-11564 External fuel vaporization study
[NASA-CR-165513] p0114 N82-14371
Progress report to the Department of Energy in The Rogers focusing heliostat experimental program at Rensselaer Polytechnic Institute [PB81-226813] p0071 N82-11625 support of basic energy and policy research p0028 N82-14648 [DE81-025882] User's guide to HELIOS: A computer program for modeling the optical behavior of reflecting solar concentrators. Part 1: Introduction and Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 code input HEAT TRANSFER COEFFICIENTS [DE81-031920] p0073 N82-12616 The effect of inclination on the heat loss from Department of Energy Solar Central Receiver Semiannual Meeting [SAND-80-8049] flat-plate solar collectors p0043 A82-11212 p0074 N82-12632 Calculation of the top loss coefficient by the Solar thermal energy systems network method and applications to solar [DE81-029295] p0077 N82-13531 collectors Gas cooled solar power plant for generating p0056 A82-15653 electrical energy in the 20 NWe operating range Study of ATES thermal behavior using a steady flow (GAST): Preliminary design phase [BMFT-FB-T-81-097] model D0080 N82-15530 HEMATITE [DE81-030883] D0159 N82-12396 HEAT TRANSMISSION The use of semiconducting oxide ceramics in solar Reduced heat flow - Mean heat flow relationship energy conversion for the continental geothermal provinces p0089 A82-10372 Catalytic effect of iron in hydrogasification of Heat flow studies and geothermal exploration in coal [DE81-0239281 p0113 N82-14323 western Trans-Pecos Texas HETEROJUNCTION DEVICES p0110 N82-12684 HEAT TRRATMENT Heterojunctions for thin film solar cells p0039 A82-10024 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates Laser bonded n-Gals/p-GaSb heterojunction p0058 A82-16469 intercell Ohmic contact Hydrodesulfurization of chlorinated coal [NASA-CASE-NPO-15304-1] p01 p0041 A82-10776 P0107 N82-12240 2n0 - p-InP heterojunction solar cells HEATERS p0051 A82-12821 Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 MHD oxidant intermediate temperature ceramic heater study [NASA-CR-165453] D0144 N82-15527 Effects of low temperature periodic annealing on HEATING the deep-level defects in 200 keV proton Utilization of waste heat from major transformer irradiated AlGaAs-GaAs solar cells Volume 1: Generic study substations. p0061 A82-18287 p0019 N82-12593 [DE81-904212] **HETEROJUNCTIONS** HEATING EQUIPMENT Zn3F2 as an improved semiconductor for Industrial applications of MHD high temperature photovoltaic solar cells air heater technology
[AIAA PAPER 81-2588] p0130
Experimental study of fuel heating at low [DE81-025587] p0069 N82-11577 p0130 A82-14037 HIGH ALTITUDE BALLOONS The transformation of wind energy by a high temperatures in a wing tank model, volume 1 altitude power plant /HAPP/ [AIAA PAPER 81-2568] [NASA-CR-165391] p0100 N82-11224 p0128 A82-14025 Energy analysis sample building data [DE81-027188] HIGH ENERGY PUBLS p0011 N82-11318 Exploratory study of coal-conversion chemistry [DE81-016136] p0119 N82 p0119 N82-15552 HIGH PRESSURE SUBJECT INDEX

HIGH PRESSURE	HOT-WIRE PLOWMETERS
Liquid natural gas rapid phase transitions	Measurement of thermal conductivities in coal fluids
[PB81-244774] p0118 82-15232	[DE82-000523] p0109 N82-12400
HIGH TEMPERATURE	HUMAN REACTIONS Establishment of noise acceptance criteria for
High-temperature solar central receivers p0052 A82-12949	wind turbines
Material property data and their use in design and	p0125 A82-11825
analysis for an elevated temperature solar code	HYDRATES
p0055 A82-14847	Thermal storage in salt-hydrates
Colloidally deposited high-temperature solar	p0153 A82-10018
selective surfaces	Design and economics of direct-contact salt
p0055 A82-15439	hydrate storage systems
Enthalpy measurement of coal-derived liquids	[SERI/TP-631-1163] p0160 N82-15558
[DE81-029481] p0097 N82-10939	HADBYOTIC BOOIDWEAL
One-dimensional equilibrium-chemistry flow model	Wind driven fluid devices for water heating
for coal combustors	p0134 A82-17639
[DE81-027622] p0099 N82-11158	Preliminary design study of underground pumped
High thermal power density heat transfer	hydro and compressed-air energy storage in hard rock. Volume 1: Executive summary
thermionic converters [NASA-CASE-LEW-12950-1] p0139 N82-11399	[DE81-029440] p0155 N82-10527
Design, cost and performance comparisons of	Preliminary design study of underground pumped
several solar thermal systems for process heat.	hydro and compressed-air energy storage in hard
Volume 1: Executive summary	rock. Volume 2: Project design criteria: UPH
[DE81-029881] p0069 N82-11576	[DE81-028107] p0156 N82-10528
Real-time coarse-particle mass measurements in a	Preliminary design study of underground pumped
high-temperature/pressure coal-gasifier process	hydro and compressed-air energy storage in hard
treatment	rock. Volume 9: Design approaches, CAES.
[DE81-030039] p0119 N82-15604	Appendix D: Mechanical systems
HIGH TEMPERATURE ENVIEONMENTS	[DE81-028200] p0156 N82-10530
Metallurgical analysis and high temperature	Preliminary design study of underground pumped
degradation of the black chrome solar selective	hydro and compressed-air energy storage in hard
absorber	rock. Volume 12: Plant design, CAES
p0060 A82-17252	[DE81-028110] p0157 N82-10574
Rate coefficients of combustion/fuel conversion reactions by high-temperature photochemistry	HYDROBROMIC ACID Halogen acid electrolysis in solid polymer
[DE81-027965] pc023 N82-13192	electrolyte cells
Hot dry rock geothermal prospects, 1981	p0084 A82-16346
[DE81-025305] p0119 N82-15559	HYDROCARBON COMBUSTION
HIGH TEMPERATURE GAS COOLED REACTORS	Dimethyl sulfate in particulate matter from coal-
Application of HTGR process heat to cil shale	and oil-fired power plants
retorting	p0005 A82-16199
p0090 A82-11851	High pressure MHD coal combustors investigation,
HIGH TEMPERATURE GASES	phase 2
High temperature cogeneration with thermionic	[DE81-027238] p0138 N82-10888
burners	Control of hydrocarbons and carbon monoxide via
p0124 A82-11817	catalytic inclneration
Towards a high-temperature solar electric converter p0056 A82-15903	[DE82-000508] p0025 M82-13560 HYDROCARBON FUEL PRODUCTION
Workshop proceedings: Combustion Turbine Residual	Jet fuel from carbon
Oil	p0090 A82-12021
[EPRI-WS-80-132] p0103 N82-11261	Application of solar power satellites to India's
Selected studies of four high-temperature	energy needs - A macroengineering solution to a
air-pollution sources	macroproblem
p0015 N82-11680	p0062 A82-18645
HIGHWAYS	Molten-salt coal-gasification process development
Construction of a recycled Portland cement	unit, phase 2
concrete pavement Connecticut expressway	[DB81-023585] p0094 N82-10251
[PB81-233553] p0023 N82-13267	Jet fuel locks to shale oil: The 1980 technology
HISTORIES	TeV1eW
Analysis of data from the US Department of Energy's meteorological validation program	[AD-A104414] p0100 N82-11228
[DE81-030100] p0097 N82-10655	Solar coal-gasification reactor for hydrocarbon-free synthesis gas
The history of the development of the rectenna	[DE81-026600] p0067 N82-11247
p0149 N82-12560	Development of catalytic systems for the
HOLE DISTRIBUTION (MECHANICS)	conversion of syngas to jet fuel and diesel fuel
Mathematical modelling of some chemical and	and higher alcohols
physical processes in underground coal	[DE82-000067] p0108 N82-12255
gasification	HYDROCARBON PURLS
[DE81-027941] p 0116 N82-14613	Alcohol fuels bibliography, 1901 - March 1980
HOMOJUNCTIONS	[DB81-025482] p0095 N82-10263
Thin-film gallium arsemide homojunction solar cells	Catalyst and reactor development for a
p0052 A82-13200	liquid-phase fischer-tropsch process
HONEYCOME STRUCTURES Development of a high-temperature durable catalyst	[DE81-028209] p0099 N82-11168
for use in catalytic combustors for advanced	Transportation fuels from synthetic gas
automotive gas tulbine engines	[DE81-029614] p0102 N82-11258 Assessment of the potential of coal-fueled heat
[NASA-CR-165396] p0142 N82-13510	engines in total and integrated energy systems
HORIZONTAL ORIENTATION	[DB82-000169] p0018 N82-12587
Yawing of wind turbines with blade cyclic pitch	HYDROCARBOBS
variation	Evaporative hydrocarbon emissions from a large
[DB81-030091] p0138 M82-11045	vehicle population
HOT CORROSION	p0004 A82-14442
Corrosion science and its application to solar	Kinetics of NO/ sub x formation during early
thermal energy material problems	stages of pulverized-coal combustion
p0038 A82-10017	[DE81-029071] p0014 N82-11641
Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 2: Hot	Pyrolysis of coal-drived fuels using the laser-powered homogeneous pyrolysis technique
component corrosion evaluation	[DE82-000251] p0106 B82-12196
[DE81-903760] p0094 B82-10253	[2000 00000 J 2000 J 2

SUBJECT INDEX HYDROGEN PRODUCTION

Identification and toxicity of	Systems analysis of hydrogen/natural gas
fractionated-shale-oil components [DE81-028460] p0021 N82-12766	supplementation and separation [DE81-021383] p0087 N82-15220
Pyrolytic characterization of the organic matter	An assessment of nonfossil hydrogen
in selected coals and in the Devcnian shales of	[PB81-246522] p0087 N82-15231
southern West Virginia	HYDROGRU COMPOUNDS
PVDD 2017 PTG 1078	Impurity effects in a-Si:H solar cells
HYDROCHLORIC ACID Halogen acid electrolysis in solid polymer	[DE81-025069] p0069 N82-11575 HYDROGEN ENGINES
electrolyte cells	A LH2 engine fuel system on board - Cold GH2
p0084 A82-16346	injection into two-stroke engine with LH2 pump
HYDROCHLORIDES	[ASME PAPER 81-HT-81] p0083 A82-10966
Plat-plate solar array project. Task 1: Silicon	Liquid hydrogen for automotive vehicles -
material: Investigation of the	Experimental results
hydrochlorination of SiC1sub4 [NASA-CR-165042] p0078 N82-14631	[ASME PAPER 81-HT-83] p0083 A82-10968 A study of factors influencing thermally induced
[NASA-CR-165042] p0078 N82-14631 HYDROCRACKING	backfiring in hydrogen fueled engines, and
Pricetown 1 underground coal gasification field	methods for backfire control
test: Operations report	p0084 A82-11791
[DE81-025162] p0095 N82-10268	HYDROGEN PUELS
Vapor-phase cracking and wet oxidation as	Puel for future transport aircraft
potential pollutant control techniques for coal	[ASME PAPER 81-HT-80] p0089 A82-10965
gasification [PB81-219594] p0015 N82-11661	A LH2 engine fuel system on board - Cold GH2 injection into two-stroke engine with LH2 pump
Catalytic hydrogenation of coal-derived liquids	[ASHE PAPER 81-HT-81] p0083 A82-10966
[DE81-030485] p0106 N82-12198	Liquid hydrogen for automotive vehicles -
HYDRODYNAMICS	Experimental results
Innovative equipment for small-scale hydro	[ASME PAPER 81-HT-83] p0083 A82-10968
developments	Lightweight hydrides for automotive storage of
[DE81-027820] p0141 N82-12634	hydrogen
HYDRORLECTRIC POWER STATIONS Design considerations for a 1500 M head 300-600 MW	p0084 A82-11790 Technological innovation for success - Liquid
double stage reversible pump/turbine with	hydrogen propulsion
regulation	p0084 A82-16734
p0154 A82-11782	The significance of hydrogen as future secondary
Preliminary design study of underground pumped	energy carrier
hydro and compressed-air energy storage in hard	p0146 A82-17127
rock. Volume 1: Executive summary	The storage of hydrogen
[DE81-029440] p0155 N82-10527 Preliminary design study of underground pumped	p0085 A82-17130 Aspects concerning the safety of hydrogen
hydro and compressed-air energy storage in hard	p0085 A82-17132
rock. Volume 2: Project design criteria: UPH	Liquid hydrogen - An outstanding alternate fuel
[DB81-028107] p0156 N82-10528	for transport aircraft
Water-related constraints to the development of	p0085 A82-17290
geothermal electric generating stations	Technical and economic aspects of hydrogen storage
[DE81-025138] p0007 N82-10561	in metal hydrides
Preliminary design study of underground pumped	[NASA-TM-76610] p0086 N82-11223
hydro and compressed-air energy storage in hard	The storage of hydrogen in the form of metal
	hydrides. In application to thermal engines
rock. Volume 12: Plant design, CAES [DE81-028110] p0157 N82-10574	hydrides: An application to thermal engines
[DB81-028110] p0157 N82-10574	[NASA-TH-76609] p0086 N82-11225
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-MITT-81-10] p0087 N82-15542
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLR-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard	[NASA-TH-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLB-MITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES,	[NASA-TH-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXYCEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equirment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower	[NASA-TH-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXYGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FB-T-81-047] p0143 N82-14666
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p019 N82-12635 DOE small-hydropower demonstration program	[NASA-TH-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLR-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUBL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXYGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FE-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equirment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control	[NASA-TH-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLR-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXYGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FE-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Eydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power	[NASA-TH-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLR-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXYGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784
[DE81-028110] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] DOE small-hydropower demonstration program [DE81-027819] Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] Micro-hydropower in the United States [DE81-028271] P0031 N82-12842	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 Hydroelectricity	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FE-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Eydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmum thermoelectrochemical hydrogen cycle
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE01-028271] p0031 N82-15567 HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLR-HITT-81-10] p0087 N82-15542 BYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 BYDROGEN CXICEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Bydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle .
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE61-028271] p0031 N82-15567 HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal	[NASA-TM-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE61-028271] HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0114 N82-14381	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-MITT-81-10] p0087 N82-15542 BYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 BYDROGEN OXIGEN FUBL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FE-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle . p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11785
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equirment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE01-028271] p0031 N82-15567 HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE01-025743] Micro-hydropower in the United States	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 BYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 BYDROGEN OXYGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Bydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle . p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid
[DE81-028110] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] DOE small-hydropower demonstration program [DE81-027819] Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] Micro-hydropower in the United States [DE81-028271] HYDRORLECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] Micro-hydropower in the United States [DE81-028271] Micro-hydropower in the United States [DE81-025743] Micro-hydropower in the United States [DE81-028271] PO031 N82-15567 HYDROGEM	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-MITT-81-10] p0087 N82-15542 BYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 BYDROGEN OXIGEN FUBL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FE-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle . p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE61-028271] HYDROBLECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE61-025743] p0114 N82-14381 Micro-hydropower in the United States [DE61-028271] HYDROGEN Liquefaction of bituminous coals using disposal	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-MITT-81-10] p0087 N82-15542 BYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 BYDROGEN OXIGEN FUBL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FB-T-81-047] p0143 N82-14666 BYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE81-028271] HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0114 N82-14381 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 HYDROGEM Liquefaction of bituminous coals using disposal ore catalysts and hydrogen	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXYGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Bydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle. p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 Solar hydrogen system design considerations
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE01-028271] p0031 N82-15567 HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE01-028271] p0031 N82-15567 HYDROGEM Liquefaction of bituminous coals using disposal ore catalysts and hydrogen [DE81-029134] p0093 N82-10154	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 BYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN CXICEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Bydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 Solar hydrogen system design considerations p0084 A82-11788
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0114 N82-14381 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 HYDROGEM Liquefaction of bituminous coals using disposal ore catalysts and hydrogen [DE81-029134] p0093 N82-10154	[NASA-TM-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmum thermoelectrochemical hydrogen cycle . p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 Solar hydrogen system design considerations p0084 A82-11788 Small-scale uses and costs of hydrogen derived
[DE81-028110] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] DOE small-hydropower demonstration program [DE81-027819] Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] Micro-hydropower in the United States [DE81-028271] HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] Micro-hydropower in the United States [DE81-028771] FYDROGEN Liquefaction of bituminous coals using disposal ore catalysts and hydrogen [DE81-029134] Hydrogen storage-bed design for tritium systems test assembly [DE81-025336]	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 BYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN CXICEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Bydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 Solar hydrogen system design considerations p0084 A82-11788
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE61-028271] p0031 N82-15567 HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE61-028271] p0031 N82-15567 HYDROGEM Liquefaction of bituminous coals using disposal ore catalysts and hydrogen [DE61-029134] p0093 N82-10154 Hydrogen storage-bed design for tritium systems test assembly [DE81-025336] Amorphous boron-silicon-hydrogen alleys for	[NASA-TH-76609] p0086 N82-11225 Bydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLE-HITT-81-10] p0087 N82-15542 BYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 BYDROGEN OXYGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FE-T-81-047] p0143 N82-14666 BYDROGEN PRODUCTION Bydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmum thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 Solar hydrogen system design considerations p0084 A82-11788 Small-scale uses and costs of hydrogen derived from OTEC ammonia
[DE81-028110] p0157 N82-10574 Prelininary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE81-028271] HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0114 N82-14381 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 HYDROGEN Liquefaction of bituminous coals using disposal ore catalysts and hydrogen [DE81-029134] p0093 N82-10154 Hydrogen storage-bed design for tritium systems test assembly [DE81-025336] Amorphous boron-silicon-hydrogen allcys for thin-film hetercjunction solar cells	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLR-MITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHFT-FE-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - 181 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 Solar hydrogen system design considerations p0084 A82-11788 Small-scale uses and costs of hydrogen derived from OTEC ammonia p0084 A82-11792 The GA sulfur-iodine water-splitting process - A status report
[DE81-028110] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] DOE small-hydropower demonstration program [DE81-027819] Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] Micro-hydropower in the United States [DE81-028271] MYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] Micro-hydropower in the United States [DE81-028271] MYDROGEM Liquefaction of bituminous coals using disposal one catalysts and hydrogen [DE81-029134] Hydrogen storage-bed design for tritium systems test assembly [DE81-025336] Amorphous boron-silicon-hydrogen allcys for thin-film hetercjunction solar cells [DE81-027234] p0068 N82-11557	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLR-MITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FURL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHTT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 Solar hydrogen system design considerations p0084 A82-11788 Small-scale uses and costs of hydrogen derived from OTEC ammonia p0084 A82-11792 The GA sulfur-iodine water-splitting process - A status report
[DE81-028110] p0157 N82-10574 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] p0158 N82-11620 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11621 Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] p0019 N82-12635 DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636 Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] p0021 N82-12842 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 HYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0031 N82-15567 HYDROGEN Liquefaction of bituminous coals using disposal ore catalysts and hydrogen [DE81-029134] p0093 N82-10154 Hydrogen storage-bed design for tritium systems test assembly [DE81-025336] Amorphous boron-silicon-hydrogen allcys for thin-film hetercjunction solar cells [DE81-027234] p0068 N82-11557 Catalytic effect of iron in hydrogasification of	[NASA-TM-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DPVLR-MITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FUEL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [EMFT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmum thermoelectrochemical hydrogen cycle. p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11785 Alkaline solution water electrolysis technology hydrogen production p0083 A82-11787 Solar hydrogen system design considerations p0084 A82-11788 Small-scale uses and costs of hydrogen derived from OTEC ammonia p0084 A82-11792 The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 Solar Chemistry of metal complexes hydrogen
[DE81-028110] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches: CAES, appendix C. Major mechanical equipment [DE81-030672] Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] DOE small-hydropower demonstration program [DE81-027819] Project impact analysis as an optimal control problem irrigation and hydroelectric power project [DE81-028465] Micro-hydropower in the United States [DE81-028271] MYDROELECTRICITY Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] Micro-hydropower in the United States [DE81-028271] MYDROGEM Liquefaction of bituminous coals using disposal one catalysts and hydrogen [DE81-029134] Hydrogen storage-bed design for tritium systems test assembly [DE81-025336] Amorphous boron-silicon-hydrogen allcys for thin-film hetercjunction solar cells [DE81-027234] p0068 N82-11557	[NASA-TH-76609] p0086 N82-11225 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DFVLR-MITT-81-10] p0087 N82-15542 HYDROGEN ISOTOPES Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DE81-030492] p0099 N82-11165 HYDROGEN OXIGEN FURL CELLS The generation of current from hydrogen p0085 A82-17131 Electrodes and diaphragms for fuel cells [BHTT-FB-T-81-047] p0143 N82-14666 HYDROGEN PRODUCTION Hydrogen generation by means of catalyzed Mg-Al hydrolysis p0083 A82-10398 Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 Solar hydrogen system design considerations p0084 A82-11788 Small-scale uses and costs of hydrogen derived from OTEC ammonia p0084 A82-11792 The GA sulfur-iodine water-splitting process - A status report

Halogen acid electrolysis in solid polymer	HYDROLOGY
electrolyte cells p0084 A82-16346	Practure flow of groundwater in coal-bearing strata [DE81-023810] p0096 N82-10479
Hydrogen from solar energy	Assessment of water supply contamination due to
p0085 A82-17129	underground coal gasification
Thermochemical processes for hydrogen production by water splitting - Prcm theory to practice	[PB81-209215] p0021 N82-12680 HYDROLYSIS
p0086 A82-18392 Assessment of potential future markets for the	Hydrogen generation by means of catalyzed Mg-Al hydrolysis
production of hydrogen from water	p0083 A82-10398
[BMFT-FB-T-81-012] p0086 N82-12266	Partial acid bydrolysis pretreatment for enzymatic
Potential supply of synthetic fuels from Alaskan nydroelectric power and coal	hydrolysis of cellulose: A process development study of ethanol production
[DE81-025743] p0114 882-14381	p0107 N82+12236
Development of a metal hydride process for	HYDROPYROLYSIS
hydrogen recovery from supplemented natural gas	Pricetown 1 underground coal gasification field test: Operations report
[DE81-022685] p0086 N82-14382 Hydrogen as carrier of secondary energy: Proposal	[DE81-025162] p0095 N82-10268
for a research and development program	HYSTERESIS
[DPVLR-MITT-81-10] p0087 N82-15542 HYDROGRE-BASED ENERGY	Evaluation of wind turbine generator operational hysteresis using 'Method of Bins'
Mechanically stable hydride composites designed	p0133 A82-17636
for rapid cycling	First results from the UMass wind tunnel test
p0084 A82-16347 Metal hydrides 1980; Proceedings of the	program for windpowered generator optimization p0134.482-17643
International Symposium on the Properties and	P0134 E02 17013
Applications of Metal Hydrides, Colorado	
Springs, CO, April 7-11, 1980. Volumes 1 & 2 p0085 A82-16784	ICE FORMATION
The significance of hydrogen as future secondary	Application of a gravity-driven wickless heat pipe
energy carrier	for ice production in a cold energy storage system
p0146 A82-17127 The generation of current from hydrogen	p0159 N82-13377
p0085 A82-17131	Environmental effects of pollutants from coal
Rechargeable metallic hydrides for hydrogen storage	combustion. 2: The Colstrip, Montana Power Plant
p0085 A82-17150 Thermochemical processes for hydrogen production	[PB81-234114] p0026 H82-13573 IDENTIFYING
by water splitting - From theory to practice	Oil spill identification by chemical analysis
p0086 A82-18392	p0115 N82-14583
Pusion as a source of synthetic fuels [BNL-29281] p0086 N82-11257	IGNITION Uncertainties associated with inertial-fusion
Assessment of potential future markets for the	ignition
production of hydrogen from water	[DE81-025408] p0139 N82-11944
[BHFT-FB-T-81-012] p0086 N82-12266 HYDROGENATION	Survey of proposed methods of burning alcohol in diesel engines
Jet fuel from carbon	[DE81-025834] p0030 N82-15219
p0090 A82-12021 H-coal process improvement study. Bench unit	IGUITION LIMITS A study of factors influencing thermally induced
baseline run with preheater/reactor	backfiring in hydrogen fueled engines, and
[DB81-026022] p0094 N82-10260	methods for backfire control
Investigation of mechanisms of hydrogen transfer in coal hydrogenation	p0084 A82-11791 Aspects concerning the safety of hydrogen
[DB81-030492] p0099 N82-11165	p0085 A82-17132
Coal hydrogenation via bonding of metallic	ILLIBOIS
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical	Wood resources and utilization patterns in the Worth Central Region and energy needs for the
importance of methylene group cleavage, part 2	manufacture of wood products
[DB81-027562] p0100 N82-11236	[DE81-030356] p0019 N82-12604
Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid	ILLUMINATING Performance predictions of passive solar
and hydrogenation of CO to produce fuels	commercial buildings
[DOE/ET-14700/1] p0102 N82-11259	[DE81-027979] p0079 N82-15247 IMPACT PUSION
Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid	Possible application of electromagnetic guns to
and hydrogenation of CO to produce fuels	impact fusion
[DOE/ET-14700/2] p0102 N82-11260 Catalytic hydrogenation of coal-derived liquids	p0135 A82-18201 IMPACT TRSTS
[DB81-030485] p0106 M82-12198	Space nuclear safety and fuels program
Hydrodesulfurization of chlorinated coal	p0111 N82-12921
[WASA-CASE-MPO-15304-1] p0107 M82-12240 Process development for improved SEC options.	IMPLOSIONS Uncertainties associated with inertial-fusion
Kerr-McGee critical sclvent deashing and	ignition
fractionation studies [DE81-903785] p0114 N82-14380	[DE81-025408] p0139 N82-11944 IMPREGENTING
[DE81-903785] p0114 #82-14380 Use of oxide decompositions in advanced	SOL-CYCLE: A solar-assisted solvent-recycling
thermochemical hydrogen cycles for solar heat	process for asphalt-impregnation of fiber board
sources. Application of the tricobalt tetraoxide-cobalt monoxide pair	[DB81-903377] p0070 N82-11615
[DE81-030235] p0082 N82-15581	Study of the electric conductivity of plasma from
HYDROGEOLOGY	fuel combustion products containing a weakly
Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of	ionizing impurity p0091 A82-12888
low- and moderate-temperature geothermal	The effects of imparities on the performance of
resource areas in California	silicon solar cells
[DE81-026038] p0109 N82-12517 Resource assessment of Low and	[NASA-CR-164945] p0067 N82-11548
moderate-temperature geothermal waters in	
Calistoga, Napa County, California [DE81-025559] p0109 N82-12518	
[DE81-025559] p0109 N82-12518	

IN-PLIGHT MOMITORING	Energy con
Energy savings with today's technology	[DE8 1-02
aircraft fuel management through in-flight monitoring	MASEC indu [DE82-00
p0005 A82-17282	Low/medium
INCRUTIVES	program
Building a consensus about energy technologies p0024 N82-13536	Executiv [DE81-02
[DE82-000501] p0024 N82-13536 INCINERATORS	Industrial
Control of hydrocarbons and carbon monoxide via	thermal
catalytic incineration	[DE81-02
[DE82-000508] p0025 N82-13560 INDEPENDENT VARIABLES	INDUSTRIAL PL Coal fly a
Pailure mode analysis using state variables	proposed
derived from fault trees with application	environm [PB81-21
[DE81-030239] p0144 N82-15454 INDIA	Developmen
A computer simulation modeling study to predict	dehydrat
air quality impacts from a 500 MW coal-fired	DE81-03 Residual-e
power plant p0020 N82-12650	analysis
Indian energy abstracts	recovery
[PB81-232316] p0032 N82-15591	[DE81-02
INDIANA Wood resources and utilization patterns in the	Feasibilit Buffalo,
North Central Region and energy needs for the	[DE82-00
manufacture of wood products	Rotating r
[DE81-030356] p0019 N82-12604 INDIUM	recovery [BMFT-FB
Low frequency capacitance characterizations on	Energy con
indium/x-phase of metal free phthalocyanine	of the c
solar cells p0053 A82-13806	BMFT-FE INDUSTRIAL SA
INDIUM COMPOUNDS	Safety and
Series resistance effects in 20 sq cm indium tin	points w
oxide-polycrystalline silicon solar cells p0051 A82-12819	suppress in coal
INDIUM PHOSPHIDES	[BMFT-PE
ZnO - p-InP heterojunction solar cells	Low-Btu-ga
p0051 A82-12821 n-/indium tin oxide//p-InF solar cells	[DE81-03 INDUSTRIAL WA
p0058 A82-16471	Fingerprin
Thin film photovoltaic devices	plants
p0063 N82-10491 INDUSTRIAL BHERGY	Enhancemen
Methods and problems of industrial-scale electric	industri
power generation from sclar energy	effects
p0050 A82-12506 Solar thermal cost goals - Implementing a	[DE81-02 Waste-to-e
methodology for assessing break-even value and	Assessme
market potential	[DE82-00
[AIAA PAPER 81-2550] p0054 A82-14013 Industrial applications of MHD high temperature	Waste heat [DE81-02
air heater technology	Proceeding
[AIAA PAPER 81-2588] p0130 A82-14037	Desulfur
Energy and ceramics Bcck p0005 A82-17076	[PB81-24 INDUSTRIES
Wind driven fluid devices for water heating	Standards
p0134 A82-17639	solar th
Energy end-use requirements in manufacturing, volume 1	[DE81-03 INERTIA
[DE81-028975] p0064 N82-10512	On the eff
Alternative fuel for the steel industry of	output -
Northern Indiana: A prefeasibility study of a central coal gasification project	INERTIAL CONF
[DE81-029314] p0010 N82-11233	Possible a
Feasibility and economic study of medium-BTU coal	impact f
gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana	Technology
[DE81-025166] p0101 N82-11237	[DE81-02
Conceptual design for a multi-user medium BTU coal	INBRTIAL PUSI
gasification complex. Volume 1: Executive summary	Uncertaint ignition
[DE81-027139] p0101 N82-11238	[DE81-02
Workshop proceedings: Combustion Turbine Residual	INPLATABLE ST
Oil [EPRI-WS-80-132] p0103 N82-11261	Low-cost m double-w
[EPRI-WS-80-132] p0103 N82-11261 Cycle and performance analysis of absorption heat	[DE81-02
pumps for waste heat utilization	IMPORMATION I
[DE81-030705] p0103 N82-11405	Millions w informat
Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV	INIOUMAT [APMD-81
systems: Users manual	Relational
[DE81-030981] p0069 N82-11569	analyzin describi
Feasibility and economic study of medium-Btu coal	describi
	f DE81-03
gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana [DE81-030622] p0107 N82-12254	[DE81-03

```
servation in distillation
                              p0018 N82-12581
8650]
strial fuel-wood program
                              p0110 N82-12595
04611
 Btu coal gasification assessment
for potential users in New Jersey:
e summary
5475]
                              p0111 N82-13247
 process heat applications for solar
technologies
                              p0081 N82-15545
59341
ANTS
sh: A review of the literature and
 classification system with emphasis on
ental impacts
p0009 N82-10608
it of a small-scale commercial alcohol
ion 190 to 200 proof
p0100 N82-11235
energy-applications program environmental
 report --- industrial scale waste heat
 equipment and utilization
                              p0024 N82-13525
7538] p0024 N82-1:
y study for an alcohol-fuels plant for
 New York
                              p0114 N82-14377
0032]
egenerative heat exchanger for energy
 in chemical plants
                              p0030 N82-15367
-T-81-099]
sumption analysis and comparative study perational results from heat pump plants
-T-80-109]
                              p0032 N82-15583
PETY
 technical optimization of belt transfer
with special consideration for the sion of noxious and explosive dusts ---
plants
-HA-80-048]
                              p0096 N82-10279
sifier emissions toxicology
1000]
                              p0014 N82-11651
STES
nting pollutant discharges from synfuels
                              p0001 A82-10697
t of methane gas production using an
ial waste in anaerobic digestion -
of chrome shavings from leather tanning
23819] p0095 N82-10267
energy Systems Institutional Barriers
nt Workshop
0098]
                              p0019 N82-12621
 and chill storage in aquifer systems
p0159 N82-14652
gs: Symposium on Flue Gas
cization, volume 2
131641
31641
                              D0035 N82-15652
application and development plan for
ermal technologies
03101
                              p0065 N82-10534
iciency of thermal engines with power
 Harmonically driven engines
                              p0131 A82-14489
PINEMENT PUSION
application of electromagnetic guns to
usicn
                              p0135 A82-18201
of controlled nuclear fusion
                              p0144 N82-15893
73611
ON (REACTOR)
ies associated with inertial-fusion
54081
                              p0139 N82-11944
RUCTURES
irror concentrator based on inflated,
alled, metallized, tubular films
                              p0081 N82-15551
27813]
DISSEMINATION
asted trying to develop major energy
ion system
-40]
                              p0029 N82-14959
methodology for integrating and ag field test and research data
ng enhanced oil recovery
                              p0118 N82-15508
```

INFORMATION MANAGEMENT	INTEGRATED ENERGY SYSTEMS
Information resources in the USA on new and	An evaluation of alternate system configurations for solar repowering electric power plants
renewable energy, a description and directory [DE81-028867] p0024 N82-13522	p0048 A82-11803
INFORMATION SYSTEMS	Los Alamos National Laboratory Passive Solar Program
Solar Energy Information Data Bank (SEIDB)	[DE81-028778] p0065 N82-10538
program, PY 1981 [DE81-030054] p0073 N82-12612	Distributed photovoltaic systems: Utility interface issues and their present status
IMPRARED DETECTORS	[NASA-CR-165019] p0076 N82-13492
Electrical properties of infrared photovoltaic	INTELSAT SATELLITES
Cd/x/dg/1-x/Te detectors p0136 A82-18466	The nickel-hydrogen battery system - An historical overview
IMPRARED RADIATION	p0153 A82-11735
Infrared quenching of photocapacitance in	INTERPACE STABILITY
Cu/x/S/CdS solar cells p0042 A82-11187	Surface and interface studies and the stability of solid solar energy materials
INJECTION MOLDING	p0037 A82-10010
Project DEEP STEAM: Pourth meeting of the	INTERPACIAL ENERGY
technical advisory panel	Solar Photovoltaic Residential Project. Project
[DE81-029457] p0144 N82-15561 INJECTORS	Integration Meeting, Agenda and Abstracts [DE81-028433] p0079 N82-14657
Pield demonstration of the conventional steam	INTERPACIAL TENSION
drive process with ancillary materials	Tertiary oil recovery processes research at the
[DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam	University of Texas [DE81-025222] p0096 N82-10477
drive process with ancillary materials	INTERMETALLICS
[DE81-026962] p0115 N82-14523	Mechanically stable hydride composites designed
INORGANIC SULFIDES Insoluble sulfide positive electrodes for organic	for rapid cycling p0084 A82-16347
electrolyte lithium secondary batteries	INTERNAL COMBUSTION ENGINES
p0155 A82-15727	A computer model of a stirling engine using a
Nicke1 sulphide-lead sulphide and nickel sulphide-cadmium sulphide selective coatings for	two-phase two-component working fluid p0137 N82-10492
solar thermal conversion	Assessment of I.C. engines as drivers for heat
p0059 A82-16745	actuated heat pumps
INSOLATION Modeling and testing a salt gradient solar pond in	[DE81-024086] p0139 N82-11421 Puel savings in hot water heating plants by
northeast Ohio	application of heat pumps operated with natural
p0043 A82-11210	gas (natural gas heat pump). Project: gas engine
A simplified method for direct calculation of the	[BMFT-FB-T-80-125] p0020 N82-12641
annual load fraction of solar systems for space heating	Barriers to the utilization of synthetic fuels for transportation
p0054 A82-14405	[NASA-CR-165517] p0023 N82-13243
Los Alamos National Laboratory Passive Solar Program	Development of a high-temperature durable catalyst
[DE81-028778] p0065 N82-10538 Mississippi County Community College solar	for use in catalytic combustors for advanced automotive gas turbine engines
photovoltaic project	[NASA-CR-165396] p0142 N82-13510
[DE81-030669] p0068 N82-11554	Automotive fuel economy: Potential improvement
Environmental data for sites in the bational Solar Data Network	through selected engine and differential gear lubricants
[DE82-00071] p0075 N82-12707	[PB81-240467] p0030 N82-15453
IBSTALLING	INTERNATIONAL TRADE
Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background	US energy strategies: Some options for eliminating oil imports by the year 2000
[DE81-030982] p0069 N82-11566	[PB81-226052] p0014 N82-11626
Study of photovoltaic cost elements. Volume 3:	INVESTIGATION
Sandia National Laboratories photovoltaic systems design catalog	Meteorological and climatological investigation: Review of January - June 1980 investigative period
[DE81-030986] p0069 N82-11567	[DE81-030740] p0111 N82-12731
Study of photovoltaic cost elements. Volume 4:	INVESTMENTS
Installation cost model for residential PV systems: Users manual	Analysis of electric utility investments into wind power
[DE81-031921] p0069 N82-11568	[AIAA PAPER 81-2537] p0003 A82-14006
Study of photovoltaic cost elements. Volume 5:	Project impact analysis as an optimal control
Installation cost model for intermediate PV systems: Users manual	<pre>problem irrigation and hydroelectric power project</pre>
[DE81-030981] p0069 N82-11569	[DE81-028465] p0021 N82-12842
INSULATION	IODINE
Comparison of residential window distributions and effects of mass and insulation	Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide
[DE81-027938] p0017 N82-12283	p0083 A82-11784
INSULATORS	The GA sulfur-iodine water-splitting process - A
Composite film selective-absorbers for solar radiation collection	status report p0084 182-11844
p0038 A82-10016	IODINE LASERS
Key contributions in MHD power generation	A solar simulator-pumped gas laser for the direct
[DE81-028121] p0138 N82-10882 Aging and corrosion problems with flat solar	conversion of solar energy p0044 A82-11710
energy absorbers. Study based upon literature	Advanced solar energy conversion solar pumped
and experiment exchanges	gas lasers
[SP-RAPP-1979/4] p0077 N82-13548	[NASA-CR-165060] p0079 N82-15526
INTEGRATED CIRCUITS The contoured-oxide monolithic series-array solar	ION EXCHANGING Ion exchange characteristics of enhanced oil
battery	recovery systems (miscibility studies)
p0042 A82-11190	[DE81-769734] p0096 N82-10478
Multijunction high voltage concentrator solar cells p0047 A82-11796	IONIC WAVES Ionization waves in an argon discharge in a
<u> </u>	longitudinal gas flow
	p0127 A82-12666

IONIZATION	jet Bngihrs
The plasmadynamics and ionization kinetics of	Dish stirling solar receiver combustor test program
thermionic energy conversion	[NASA-CR-165017] p0076 N82-13495
p0137 N82-10494	JET PLOW
IOMOSPHERE	Modelling of the jet-stream Fluidyne
Ionospheric power beam studies	p0124 A82-11812
p0147 N82-12542	Experimental and analytical investigation of a
IONOSPHERIC DISTURBANCES	fluidic power generator
Proposed experimental studies for assessing	[JPL-PUB-81-100] p0142 N82-13386
ionospheric perturbations on SPS uplink pilot	JRT IMPINGEMENT
beam signal	Jet impingement heat transfer enhancement for the
p0147 N82-12543	GPU-3 Stirling engine [NASA-TM-82727] p0140 N82-11993
Ionospheric effects in active retrodirective array and mitigating system design	[M M M M M M M M M M M M M M M M M M M
p0147 N82-12551	V
IONOSPHERIC HEATING	K
Space chamber experiments of ohmic heating by high	KAHSAS
power microwave from the Solar Power Satellite	Wood resources and utilization patterns in the
p0145 A82-16991	North Central Region and energy needs for the
IOWA	manufacture of wood products
Wood resources and utilization patterns in the	[DE81-030356] p0019 N82-12604
North Central Region and energy needs for the	KBBTUCKY
manufacture of wood products	Solvent-Refined Coal-1 Demonstration Project.
[DE81-030356] p0019 N82-12604	Final environmental impact statement, Volume 1
IRON	of 2 coal liquefaction plant at Newman,
Catalytic effect of iron in hydrogasification of	Kentucky
coal	[DE81-025983] p0010 N82-11252
[DE81-023928] p0113 N82-14323	Evaluation of Devonian shale potential in eastern
IRON COMPOUNDS	Kentucky/Tennessee
Oxydesulfurization of coal by acidic iron sulfate	[DE82-001164] p0116 N82-14595
solutions	KEROSENE
[DB82-000464] p0106 N82-12199	Characterization of diesel emissions as a function
Synthesis gas conversion to liquid fuels using	of fuel variables
promoted fused iron catalysts	[PB81-244048] p0118 N82-15233
[DE81-030857] p0108 N82-12259 IRON-CHROMIUM REDOX EATTERIES	KINETIC EMERGY The plasmadynamics and ionization kinetics of
NASA preprototype redox storage system for a	thermionic energy conversion
photovoltaic stand-alone application	p0137 N82-1049
p0153 A82-11774	Performance evaluation of the solar kinetics T-700
IRRADIANCE	line concentrating solar collector
Automated Fresnel lens tester system	[NASA-CR-161856] p0063 N82-10502
[DE81-029483] p0066 N82-10863	KINETICS
IRRIGATION	Rate coefficients of combustion/fuel conversion
Irrigation market for solar thermal parabolic dish	reactions by high-temperature photochemistry
systems	[DE81-027965] p0023 N82-13192
[NASA-CR-164955] p0068 N82-11549	KLYSTROBS
Project impact analysis as an optimal control	Direct conversion of light to radio frequency energy
problem irrigation and hydroelectric power	using photoklystrons for solar power
project	satellites
[DE81-028465] p0021 N82-12842	p0045 A82-11712
ISOMERIZATION	High efficiency SPS klystron design
Development of superior denitrogenation and	p0148 N82-12552
isomerization catalysts for processing crude oil	Analytic investigation of efficiency and
derived from shale, part 1	performance limits in klystron amplifiers using
[AD-A105667] p0113 N82-14317	multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode
ISOTOPE SEPARATION Environmental readiness document. Advanced	life studies
	p0148 N82-1255
Isotope Separation Program [DE81-029952] p0029 N82-14900	po 140 - 1255.
ISOTOPIC ENRICHMENT	
Environmental readiness document. Advanced	L
Isotope Separation Program	LAND USE
[DE81-029952] p0029 N82-14900	Siting and land-use considerations in wind energy
	development
	[AIAA PAPER 81-2541] p0003 A82-14009
U	LANDFILLS
JET ENGINE FUELS	Evaluation of landfill gas as an energy source
Fuel for future transport aircraft	feasibility of methane recovery from landfills
[ASHE PAPER 81-HI-80] p0089 A82-10965	[DE82-000116] p0110 N82-12584
Jet fuel from carbon	LARGE SPACE STRUCTURES
p0090 A82-12021	Contributions of space reflector technology to
A protective additive for jet fuels	food production, local weather manipulation and
p0090 182-12022	energy supply, 1985-2020
Development and application of analytical	p0054 A82-14445
techniques to chemistry of donor sclvent	LASER APPLICATIONS
liquefaction [DE81-025961] p0099 N82-11167	Pyrolysis of coal-drived fuels using the
	laser-powered homogeneous pyrolysis technique
Experimental study of fuel heating at low	[DE82-000251] p0106 N82-12196
temperatures in a wing tank model, volume 1 [NASA-CR-165391] p0100 N82-11224	Comparative analyses of space-to-space central power stations
[NASA-CR-165391] p0100 N82-11224 Jet fuel locks to shale oil: The 1980 technology	[NASA-TP-1955] P0150 N82-14202
review	LASER MATERIALS
[AD-A104414] p0100 N82-11228	Luminescent solar concentrators. II - Experimental
Development of catalytic systems for the	and theoretical analysis of their possible
conversion of syngas to jet fuel and diesel fuel	efficiencies
and higher alcohols	p0052 A82-13285
[DE82-000067] p0108 N82-12255	• ·

LASER PUMPING	LIGHITE
Advanced solar energy conversion solar pumped	Kinetics and mechanisms of catalytic
qas lasers	hydroliquefaction and hydrogasification of lignite
[NASA-CR-165060] F0079 N82-15526	[DE81-023581] p0092 #82-10144
LAW (JURISPRUDBUCE)	Chemistry of lignite liquefaction
Energy end-use requirements in manufacturing, volume 3	[DE81-030178] p0093 N82-10249 LINESTOR
[DE81-027976] p0007 N82-10544	Stratigraphy and depositional history of the Iola
Methodology for determining the impact of	Limestone Upper Pennsylvanian (Missourian),
environmental regulatory programs	Northern Midcontinent U.S.
[DB81-903429] p0009 N82-10594	p0116 N82-14711
Relaxing environmental standards during oil-supply disruptions: Past, present and future	An optimization model for energy generation and
[DE81-024250] p0009 N82-10601	distribution in a dynamic facility
Natural gas plan needed to provide greater	p0011 N82-11310
protection for high-priority and critical uses	Modelling energy-economic interactions in
[PB81-228488] p0023 N82-13255 LAWS	<pre>developing countries: A linear-programming approach</pre>
Photovoltaic market analysis program: Background,	[DE81-026048] p0020 N82-12637
model development, applications and extensions	Application of an LP model to strategic planning
[DE81-029711] p0073 H82-12609	of multinational cooperative RD and D programs
LEACHING	[DB81-029325] p0035 N82-16014
Assessment of water supply contamination due to underground coal gasification	LIQUEFIED HATURAL GAS Study of gelled LNG
[PB81-209215] p0021 N82-12680	[DE81-023259] p0095 H82-10269
LEAD ACID BATTERIES	Environmental impacts of energy transportation
Effect of positive pulse charge waveforms on the	[DB82-900316] p0025 H82-13559
energy efficiency of lead-acid traction cells [NASA-TM-82709] p0155 N82-10503	Liquid natural gas rapid phase transitions p0118 N82-15232
[NASA-TM-82709] p0155 N82-10503 Rapid charging of lead-acid batteries for	[PB81-244774] p0118 N82-15232 Three-dimensional, finite elemental model for
electric-vehicle propulsion and solar-electric	simulating heavier-than-air gaseous releases
storage	over variable terrain
[DE81-028084] p0157 N82-10548	[DE81-028689] p0032 N82-15602
Near-term batteries for electric vehicles [DE81-023543] p0157 N82-10556	LIQUID CHROMATOGRAPHY Development and application of analytical
Recent advances in lead-acid cell research and	techniques to chemistry of donor solvent
development	liquefaction
[DE81-023104] p0158 N82-11580	[DB81-029125] p0099 N82-11166
LEAD SULPIDES	LIQUID COOLING
Solution grown PbS/CdS multilayer stacks as selective absorbers	Water-cooled gas turbine development program [DE81-904245] p0136 N82-10406
p0041 A82-10472	LIQUID PLON
Nickel sulphide-lead sulphide and nickel	Thermophysical properties of coal liquids
sulphide-cadmium sulphide selective coatings for	[DE81-0279446] p0097 N82-10938
solar thermal conversion p0059 A82-16745	Pormation evaluation in liquid-dominated geothermal reservoirs
LENS DESIGE	[DOE/ET-28384/T1] p0109 N82-12514
Efficiency of Fresnel lenses	LIQUID PUBLS
p0043 A82-11387	U.S. Department of Energy liquid synfuels overview
LIFE CYCLE COSTS A hidden advantage of permanent magnet electrical	p0090 A82-12531 Peasibility of solar assisted ethanol production
generating systems	[AIAA PAPER 81-2533] p0054 A82-14004
p0122 A82-11720	Liquid hydrogen - An outstanding alternate fuel
The effect of concentrator field layout on the	for transport aircraft p0085 A82-17290
EE-1 small community sclar power system p0048 A82-11799	Application of solar power satellites to India's
LIPE SCIENCES	energy needs - A macroengineering solution to a
Health and safety research division	macroproblem
[DE81-026088] p0026 N82-13652	p0062 A82-18645
A first order mathematical model of the lift/drag	Catalyst and reactor development for a Liquid-phase fischer-tropsch process
characteristics of aerofoil sections	[DE81-028209] p0099 N82-11168
p0130 A82-14357	LIQUID HYDROGEN
An indoor blade test facility for determining the	Puel for future transport aircraft
basic aerodynamic properties of Darrieus wind turbine airfoils with test results for an NACA	[ASME PAPER 81-HT-80] p0089 A82-10965 A LH2 engine fuel system on board - Cold GH2
0015 and a modified section	injection into two-stroke engine with LH2 pump
p0136 N82-10005	[ASME PAPER 81-HT-81] p0083 A82-10966
LIGHT AIRCHAFT	Liquid hydrogen for automotive vehicles -
Wing design for light transport aircraft with	Experimental results
improved fuel economy p0004 A82-14416	[ASME PAPER 81-HT-83] p0083 A82-10968 Technological innovation for success - Liquid
LIGHT TRANSMISSION	hydrogen propulsion
Efficiency of Fresnel lenses	p0084 A82-16734
p0043 A82-11387	Liquid hydrogen - An outstanding alternate fuel
LIGHT WATER REACTORS Potential contribution of currently operating	for transport aircraft p0085 182-17290
nuclear-fueled electric-generating units to	Hydrogen as carrier of secondary energy: Proposal
reducing OS oil consumption	for a research and development program
[DE81-030497] p0031 N82-15553	[DFVLR-MITT-81-10] p0087 N82-15542
LIGHTING EQUIPARET Appliance efficiency and the solar building	LIQUID HETALS Liquid-metal MHD for solar and coal
[DE81-029073] p0075 H82-13265	[DE81-023545] p0137 H82-10553
LIGHTHING SUPPRESSION	LIQUID PHASE EPITAXY
Lightning protection for wind turbine electronics	Gals solar cells for space application
[AIAA PAPEE 81-2571] p0129 A82-14028 Lightning protection for ccmposite rotor blades	p0046 A82-11766
of windrowered turbines	
-0432 102 47424	

p0133 A82-17631

LIQUID WASTES	MAGNETIC DISPERSION
Chemical element concentrations in liquids and solids associated with power plants using PGD	Selective separation of coal feedstocks for
solids associated with power plants using FGD	conversion by magnetic separation techniques [DE81-028060] p0108 B82-12263
Systems	MAGNETIC FIELD COMPIGURATIONS
LIQUID-VAPOR EQUILIBRIUM	Nonlinear development of magnetic reconnection in
Measured performance of falling-jet flash	the tearing-type and the Petschek-type field
evaporators	geometries
[DE81-024355] p0161 E82-10565 LITEIUM PLUORIDES	p0132 A82-17015 HAGERTIC INDUCTION
Rechargeable lithium/vanadium oxide cells	Wind-energy recovery by a static Scherbius
utilizing 2Me-THF/LiAsP6	induction generator
p0154 Ad2-15726	
LITHIUM SULFUR BATTERIES	MAGNETIC SURVEYS
Insoluble sulfide positive electrodes for organic	Geophysical survey, Paso Robles geothermal area, California, part of the resource assessment of
electrolyte lithium secondary batteries p0155 A82-15727	
Recent progress in lithium/iron sulfide battery	resource areas in California
development	[DE81-026038] p0109 N82-12517
[DB81-023127] p0157 M82-10557	
Practure flow of groundwater in coal-bearing strata	area of the Central European rift system [BMFT-FB-T-81-111] p0119 N82-15656
[DE81-023810] p0096 M82-10479	
Geologic considerations in underground coal mining	Selective separation of coal feedstocks for
system design	conversion by magnetic separation techniques
[NASA-CR-164961] p0104 N82-11516	
Formation evaluation in liquid-dominated geothermal reservoirs	MAGNETOHYDRODYNAMIC GENERATORS Correlation between results of zone method and
[DOE/ET-28384/T1] p0109 H82-12514	experiment in radiative heat transfer
Stratigraphy and depositional history of the Iola	[ASME PAPER 81-HT-71] p0121 A82-10958
Limestone Upper Pennsylvanian (Missourian),	[ASME PAPER 81-HT-71] p0121 A82-10958 Advances in coal fired MHD generator research n0126 A82-11853
Northern Midcontinent U.S. p0116 N82-14711	Format and triver
LOAD DISTRIBUTION (FORCES)	p0126 A82-11854
Load-change testing of a large commercial oxygen	Flow aerodynamics modeling of an MHD swirl
=1 4	combustor - Calculations and experimental
[BPRI-NP-1824] p0096 N82-10275	
LOAD TESTS Regional load-curve models: Scenario and forecast	p0127 A82-12113 Ionization waves in an argon discharge in a
using the DRI model	longitudinal gas flow
[DE81-904192] p0033 N82-15605	
LOADS (FORCES)	Increasing power and efficiency by dynamic
An overview of fatigue failures at the Rocky Flats	suppression of ionization instability in a plasma
Wind System Test Center p0125 A82-11828	p0127 A82~12897 Assessment of MHD power plants with coal
LOGISTICS	qasification
The all electric airplane - Its development and	[AIAA PAPER 81-2574] p0129 A82-14030 A design for an MHD power plant as a prime mover
logistic support	A design for an MHD power plant as a prime mover
p0004 A82-14709	for a Naval Vessel [AIAA PAPER 81-2575] p0129 A82-14032
LONG TRRM EFFECTS Long-term performance of the Hunn passive solar	
residence	existing coal-fired plants
[DE81-028735] p0070 N82-11600	Problems and potential for MHD retrofit of existing coal-fired plants [AIAA PAPER 81-2586] p0130 A82-14036
LOW COST	Industrial applications of MHD high temperature
Low-cost solar flat-plate-collector development	air heater technology [AIAA PAPER 81-2588] p0130 A82-14037
[DE81-025081] p0070 N82-11584	End region and current consolidation effects upon
The effect of shielding on the aerodynamic	the performance of an MHD channel for the ETF
performance of Savonius wind turbines	conceptual design Engineering Test Facility
p0125 A82-11826	
LOW TREPERATURE Effects of low temperature periodic annealing on	Optical diagnostic techniques for coal-fired MHD applications
the deep-level defects in 200 keV proton	[AIAA PAPER 82-0377] p0135 A82-17913
irradiated AlGaAs-GaAs solar cells	MHD coal combustor development
p0061 A82-18287	
LOW TRMPERATURE ENVIRONMENTS Experimental study of fuel heating at low	MHD generator scaling analysis for baseload , commercial power plants
temperatures in a wing tank model, volume 1	[AIAA PAPER 82-0394] p0135 A82-17922
[NASA-CR-165391] p0100 N82-11224	
LUBRICANIS	connected MHD generator
Automotive fuel economy: Fotential improvement	[AIAA PAPER 82-0395] p0135 A82-17923
through selected engine and differential gear lubricants	Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator
[PB81-240467] p0030 H82-15453	
	Magnetohydrodynamics MHD Engineering Test Pacility
M	ETF 200 MWe power plant. Conceptual Design
MAGNESIUM	Engineering Report CDER. Volume 3: Costs and schedules
Hydrogen generation by means of catalyzed Mg-Al	[NASA-CR-165452-VOL-3] p0137 N82-10495
hydrolysis	Liquid-metal MHD for solar and coal
p0083 A82-10398	[DE81-023545] p0137 N82-10553
MAGNESIUM COMPOUNDS	Key contributions in MHD power generation
The storage of hydrogen in the form of metal hydrides: An application to thermal engines	[DE81-028121] p0138 N82-10882 One-dimensional equilibrium-chemistry flow model
[NASA-TM-76609] p0086 N82-11225	
MAGNESIUM OZIDES	[DE81-027622] p0099 N82-11158
Improved efficiency in the sulfur dickide - Iodine	Mass spectrometric studies of MHD slag
hydrogen cycle through the use of magnesium oxide p0083 A82-11784	thermochemistry [PB81-221434] p0138 N82-11173
P0000 A02-11704	

Energy center at Mississippi State University	[DE81-023122] p0066 N82-10952
and structural features of MHD radiant boilers	HANGABESE IONS
[DB81-029901] p0139 N82-11934	Photoanode on the base of pheophytin-sensitized
Development, testing, and evaluation of MHD	reactions p0059 A82-16742
materials and component designs. Volume 1: Executive summary	MABIPOLDS POUS EGZ-10742
[DE81-026203] p0139 N82-11947	An analytical comparison of the efficiency of
Magnetohydrodynamics (MED) Engineering Test	solar thermal collector arrays with and without
Pacility (ETP) 200 MHe power plant. Design	external manifolds
Requirements Document (DRD) [NASA-TH-82705] p0140 N82-12446	[HASA-CR-161852] p0063 N82-10501 HANUFACTURING
Magnetohydrodynamics (MHD) Engineering Test	Energy end-use requirements in manufacturing,
Pacility (ETF) 200 MWe power plant. Conceptual	volume 1
Design Engineering Report (CDER). Volume 1:	[DB81-028975] p0064 N82-10512
Executive summary [NASA-CR-165452-VOL-1] p0140 NB2-12570	Energy end-use requirements in manufacturing, volume 3
End region and current consolidation effects upon	[DE81-027976] p0007 N82-10544
the performance of an MHD channel for the ETF	The effects of impurities on the performance of
conceptual design	silicon solar cells [NASA-CR-164945] p0067 N82-11548
[NASA-TM-82744] p0141 N82-12943 Two-dimensional effects in power take-off region	[NASA-CR-164945] p0067 B82-11548 MAPPING
[DB82-000091] p0141 M82-13367	Peat resource evaluation: State of Maine
Blectrical effects of slag in a diffuse mode	[DE82-000227] p0109 N82-12523
magnetohydrodynamic generator	MARINE CHEMISTRY
p0143 M82-13550 Testing and evaluation of MBD materials and	Chemical and geochemical studies off the coast of Washington
substructures	[DE81-030319] p0017 N82-12513
[DE81-024331] p0143 N82-13926	MARINE BUVIRONABETS
Conceptual design of superconducting magnet system	Environmental and radiological safety studies:
for Magnetchydrodynamic (HHD) Engineering Test Facility (ETF) 200 MWe rower plant	Interaction of (238) Pu02 heat sources with terrestrial and aquatic environments
[NASA-CR-165053] p0143 N82-14520	[DE81-032019] p0025 N82-13565
Advanced solar energy conversion solar pumped	Environmental assessment of the Alaskan
gas lasers [NASA-CR-165060] p0079 N02-15526	Continental Shelf: Annual reports of principal
[NASA-CR-165060] p0079 N82-15526 MBD oxidant intermediate temperature ceramic	investigators for the year ending March 1980. Volume 5: Hazards
heater study	[PB81-225732] p0026 N82-13607
[NASA-CR-165453] p0144 N82-15527	The Seasat commercial demonstration program
IAGNETOHYDEODYNAMIC STABILITY The tilting mode in field-reversed configurations	p0115 N82-14561
stability of toroidal plasma equilibria	Offshore petroleum industry environmental data
p0121 A82-11131	requirements: Emphasis on remote sensing
Increasing power and efficiency by dynamic	p0027 N82-14557
suppression of ionization instability in a plasma	MARINE RESOURCES
suppression of ionization instability in a plasma p0127 A02-12897	MARINE RESOURCES Maritime support for ocean-resources development
suppression of ionization instability in a plasma	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 N82-12735 MARINE TECHNOLOGY
suppression of ionization instability in a plasma p0127 A82-12897 Wonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 N82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015	HARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 H82-12735 HARINE TECHNOLOGY Haritime support for ocean-resources development [AD-A104730] p0111 H82-12735
suppression of ionization instability in a plasma p0127 A82-12897 Wonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 N82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 IAGHETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico	HARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 HARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 HARIET BESEARCH Photovoltaic system studies and developments p0049 A82-11804
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 IAGHETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661	HARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 N82-12735 HARINE TECHNOLOGY Haritime support for ocean-resources development [AD-A104730] p0111 N82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 IAGNETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 IAGNETIONS	HARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 HARINE TECHNOLOGY Haritime support for ocean-resources development [AD-A104730] p0111 M82-12735 HARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 IAGHETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661	HARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 N82-12735 HARINE TECHNOLOGY Haritime support for ocean-resources development [AD-A104730] p0111 N82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 IAGNETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 IAGNETICUS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 N82-12735 MARINE TECHNOLOGY Haritime support for ocean-resources development [AD-A104730] p0111 N82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGUSTORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGUSTROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554	HARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 HARINE TECHNOLOGY Haritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 IAGNETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 IAGNETIONS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 IAGNETS A hidden advantage of permanent magnet electrical	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGUSTORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGUSTROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554	HARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 HARINE TECHNOLOGY Haritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGUSTORSSISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGUSTOWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720	HARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 882-12735 HARINE TECHNOLOGY Haritime support for ocean-resources development [AD-A104730] p0111 882-12735 HARINET RESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Market potential and problems for SSPS Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Harket assessment of photovoltaic power systems
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 ABGESTORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 ABGESTORES The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 ALUES Peat resource evaluation: State of Maine	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Market potential and problems for SSPS Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 AIMB Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico [MASA-CR-165441] p0007 M82-10506
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGUSTORSSISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGUSTOWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 ALUS Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 ANAGEMENT Satellite power system: Concept development and	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico
suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 ABGERTORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 ABGERTORES The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 ALIEE Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 ANAGEMENT Satellite power system: Concept development and evaluation grogram. Volume 4: Energy	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico [MASA-CR-165441] p0007 N82-10506 Irrigation market for solar thermal parabolic disa systems [NASA-CR-164955] p0068 N82-11549
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] P0119 N82-15661 AGMETRONS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 Addents A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 [AIIII Peat resource evaluation: State of Maine [DE82-000227] [DE82-000227] Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico [MASA-CR-165441] p0007 M82-10506 Irrigation market for solar thermal parabolic dish systems [MASA-CR-164955] p0068 M82-11549 Mational coal-market conditions for the year 2000:
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETOMS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 Addended advantage of permanent magnet electrical generating systems p0122 A82-11720 ALUE Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 ANAGREENT Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4]	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico [MASA-CR-165441] p0007 N82-10506 Irrigation market for solar thermal parabolic disa systems [NASA-CR-164955] p0068 N82-11549
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] P0119 N82-15661 AGMETRONS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 Addents A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 [AIIII Peat resource evaluation: State of Maine [DE82-000227] [DE82-000227] Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET RESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico [MASA-CR-165441] p0007 N82-10506 Irrigation market for solar thermal parabolic disa systems [MASA-CR-164955] p0068 M82-11549 National coal-market conditions for the year 2000: Regional-issue identification and analysis, high
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 Addlets A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 ANNE Peat resource evaluation: State of Maine [DE82-000227] Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] seminars for private college administrators on solar applications for college buildings [DE81-027981]	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] MARINET RESPARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] Market assessment of photovoltaic power systems for agricultural applications in Bexico [NASA-CR-165441] Irrigation market for solar thermal parabolic dish systems [NASA-CR-164955] P0068 N82-11549 National coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DE81-026425] Assessment of potential future markets for the
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETOMS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 AIMB Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 ANAGREENT Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] p0078 N82-14634 Seminars for private college administrators on solar applications for college buildings [DE81-027981] ANAGEMENT AWALYSIS	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET RESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 Inrigation market for solar thermal parabolic disa systems [NASA-CR-164955] p0068 N82-11549 Mational coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DB81-026425] Assessment of potential future markets for the production of hydrogen from water
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 Addlets A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 ANNE Peat resource evaluation: State of Maine [DE82-000227] Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] seminars for private college administrators on solar applications for college buildings [DE81-027981]	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] MARINET RESPARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] Market assessment of photovoltaic power systems for agricultural applications in Bexico [NASA-CR-165441] Irrigation market for solar thermal parabolic dish systems [NASA-CR-164955] P0068 N82-11549 National coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DE81-026425] Assessment of potential future markets for the
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETONS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 ALUE Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 ANAGEMENT Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] p0078 N82-14634 Seminars for private college administrators on solar applications for college buildings [DE81-027981] ANAGEMENT ANALYSIS Analysis report: Applied analysis model summaries [DE81-029278] ANAGEMENT INFORMATION SYSTEMS	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] MARINET RESPARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] Market assessment of photovoltaic power systems for agricultural applications in Mexico [MASA-CR-165441] Irrigation market for solar thermal parabolic disa systems [NASA-CR-164955] National coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DE81-026425] Assessment of potential future markets for the production of hydrogen from water [BMFT-FE-T-81-012] Market assessment of photovoltaic power systems for agricultural applications in Morocco
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETOMS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 ANDE Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 ANAGREET Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-V01-4] p0078 N82-14634 Seminars for private college administrators on solar applications for college huildings [DE81-027981] ANAGREENT ANALYSIS Analysis report: Applied analysis model summaries [DE81-029278] ANAGREENT INFORMATION SYSTEMS Millions wasted trying to develop major energy	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET RESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Market potential cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 Irrigation market for solar thermal parabolic dish systems [NASA-CR-164955] p0068 N82-11549 Mational coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DE81-026425] p0016 N82-11988 Assessment of potential future markets for the production of hydrogen from water [BMFT-FE-T-81-012] p0086 N82-12266 Market assessment of photovoltaic power systems for agricultural applications in Morocco [NASA-CR-165477] p0077 N82-14627
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETONS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems p0122 A82-11720 ALIEE Peat resource evaluation: State of Maine [DE82-000227] Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] Seminars for private college administrators on solar applications for college buildings [DE81-027881] ANAGEMENT ANALYSIS Analysis report: Applied analysis model summaries [DE81-029278] ANAGEMENT IBPORNATION SYSTEMS Hillions wasted trying to develop major energy information system	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] MARINET BESEARCH Photovoltaic system studies and developments p0049 A82-12735 Market potential and problems for SSPS Market potential cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] Market assessment of photovoltaic power systems for agricultural applications in Mexico [MASA-CR-165441] Irrigation market for solar thermal parabolic dish systems [NASA-CR-164955] Mational coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DE81-026425] Assessment of potential future markets for the production of hydrogen from water [BMFT-PE-T-81-012] Market assessment of photovoltaic power systems for agricultural applications in Morocco [NASA-CR-165477] International energy indicators
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries p0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] AGMETEONS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 Adden advantage of permanent magnet electrical generating systems p0122 A82-11720 ANIBE Peat resource evaluation: State of Maine [DE82-000227] FORMAGEMENT Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] Seminars for private college administrators on solar applications for college buildings [DE81-027981] ANAGEMENT ANALYSIS Analysis report: Applied analysis model summaries [DE81-029278] ANAGEMENT INFORMATION SYSTEMS Hillions wasted trying to develop major energy information system [APHD-81-40] P0029 E82-14959	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] MARINET RESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Market potential cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] Irrigation market for solar thermal parabolic dish systems [NASA-CR-164955] Mational coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DE81-026425] Assessment of potential future markets for the production of hydrogen from water [BMFT-FE-T-81-012] Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165477] P0086 N82-112266
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries P0132 A82-17015 AGUSTORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] P0119 N82-15661 AGUSTROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems P0122 A82-11720 ALIES Peat resource evaluation: State of Maine [DE82-000227] P0109 N82-12523 AMAGEMENT Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] Seminars for private college administrators on solar applications for college buildings [DE81-027981] AMAGEMENT AMALYSIS Analysis report: Applied analysis model summaries [DE81-029278] AMAGEMENT INFORMATION SYSTEMS Millions wasted trying to develop major energy information system [APHD-81-40] AMAGEMENT PLANNING Need for power and the choice of technologies:	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARIBE TECHMOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Market potential cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico [MASA-CR-165441] p0007 N82-10506 Inrigation market for solar thermal parabolic dish systems [NASA-CR-164955] p0068 N82-11549 Mational coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DB81-026425] p0016 N82-11988 Assessment of potential future markets for the production of hydrogen from water [BMFT-FE-T-81-012] p0086 N82-12266 Market assessment of photovoltaic power systems for agricultural applications in Morocco [NASA-CR-165477] p0077 N82-14627 International energy indicators [DB81-028117] Systems analysis of hydrogen/natural gas supplementation and separation
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries P0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] P0119 N82-15661 AGMETROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems P0122 A82-11720 ALIES Peat resource evaluation: State of Maine [DE82-000227] P0109 N82-12523 AMAGEMENT Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] Seminars for private college administrators on solar applications for college buildings [DE81-027981] AMAGEMENT AWALYSIS Analysis report: Applied analysis model summaries [DE81-027981] AMAGEMENT INFORMATION SYSTEMS Millions wasted trying to develop major energy information system [APMD-81-40] P0029 N82-14959 AMAGEMENT PLANNING Need for power and the choice of technologies: State decisions on electric power facilities	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] MARINET RESPARCH Photovoltaic system studies and developments
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries P0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems P0122 A82-11720 ANNE Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 ANAGEMENT Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] p0078 N82-14634 Seminars for private college administrators on solar applications for college buildings [DE81-027981] ANAGEMENT ANALYSIS Analysis report: Applied analysis model summaries [DE81-02978] p0079 N82-14661 ANAGEMENT INFORMATION SYSTEMS Millions wasted trying to develor major energy information system [APMD-81-40] p0029 N82-14959 ANAGEMENT PLANNING Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644	MARINE BESOURCES Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARIBE TECHMOLOGY Maritime support for ocean-resources development [AD-A104730] p0111 M82-12735 MARKET BESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS Market potential cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 Market assessment of photovoltaic power systems for agricultural applications in Mexico [MASA-CR-165441] p0007 N82-10506 Inrigation market for solar thermal parabolic dish systems [NASA-CR-164955] p0068 N82-11549 Mational coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DB81-026425] p0016 N82-11988 Assessment of potential future markets for the production of hydrogen from water [BMFT-FE-T-81-012] p0086 N82-12266 Market assessment of photovoltaic power systems for agricultural applications in Morocco [NASA-CR-165477] p0077 N82-14627 International energy indicators [DB81-028117] Systems analysis of hydrogen/natural gas supplementation and separation
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries P0132 A82-17015 AGMETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] p0119 N82-15661 AGMETROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 A hidden advantage of permanent magnet electrical generating systems P0122 A82-11720 ANNE Peat resource evaluation: State of Maine [DE82-000227] p0109 N82-12523 ANAGEMENT Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TH-58237-VOL-4] p0078 N82-14634 Seminars for private college administrators on solar applications for college buildings [DE81-027981] ANAGEMENT ANALYSIS Analysis report: Applied analysis model summaries [DE81-02978] p0079 N82-14661 ANAGEMENT INFORMATION SYSTEMS Millions wasted trying to develor major energy information system [APMD-81-40] p0029 N82-14959 ANAGEMENT PLANNING Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] p0027 N82-14644	MARINE RESOURCES Naritime support for ocean-resources development [AD-A104730] MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] MARINET RESEARCH Photovoltaic system studies and developments
Suppression of ionization instability in a plasma p0127 A82-12897 Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries P0132 A82-17015 IAGNETORESISTIVITY Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico [DE81-025302] P0119 N82-15661 IAGNETROWS The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 IAGNETS A hidden advantage of permanent magnet electrical generating systems Peat resource evaluation: State of Maine [DE82-000227] IANAGEMENT Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TM-58237-VOL-4] p0078 N82-14634 Seminars for private college administrators on solar applications for college buildings [DE81-027981] IANAGEMENT ANALYSIS Analysis report: Applied analysis model summaries [DE81-029278] ANAGEMENT INFORMATION SYSTEMS Hillions wasted trying to develor major energy information system [APMD-81-40] ANAGEMENT PLANNING Need for power and the choice of technologies: State decisions on electric power facilities [DE81-025960] ANAGEMENT SYSTEMS	MARINE RESOURCES Maritime support for ocean-resources development [AD-A104730] MARINE TECHNOLOGY Maritime support for ocean-resources development [AD-A104730] MARKET RESEARCH Photovoltaic system studies and developments p00111 N82-12735 MARKET RESEARCH Photovoltaic system studies and developments p0049 A82-11804 Market potential and problems for SSPS p0050 A82-12502 Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] Irrigation market for solar thermal parabolic dish systems [NASA-CR-164955] National coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DE81-026425] Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165477] International energy indicators [DB81-0281177] Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021363] MARKETIMG Solar thermal central receivers for industrial

SUBJECT INDEX HATHEMATICAL MODELS

MARKOW PROCESSES MATERIALS TESTS The effect of non-Markovian cloud patterns on the design of a regulator for a solar-rowered boiler Introduction to photovoltaics - Physics, materials and technology p0038 A82-10022 p0052 A82-13083 Status report on MHD generator materials p0126 A82-11854 Density-measurement studies at the BI-GAS pilot plant Use of ceramics in point-focus solar receivers
[AIAA PAPER 81-2552] p0054 A82 [DE82-000910] P0054 A82-14015 p0108 N82-12262 Experimental and analytical investigation of a MATHEMATICAL MODELS fluidic power generator [JPL-PUB-81-100] A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell p0142 N82-13386 Real-time coarse-particle mass measurements in a p0050 A82-12817 Mathematical simulation model for the operation of the optical system of a solar power station high-temperature/pressure coal-gasifier process treatment p0053 A82-13718
An analytical model for high-low-emitter /HLE/ [DE81-030039] p0119 N82-15604 MASS SPECTROMETERS Soot formation in synfuels solar cells in concentrated sunlight p0055 A82-15441 [DE81-030273]
HASS SPECTROSCOPY D0099 N82-11164 Theoretical and numerical resolution of a mathematical model of the release of solar Vaporization and chemical transport under coal gasification conditions energy from storage [PB81-245839] p0117 N82-15165 MASS TRANSPER A simplified model of the thermohydraulic behaviour of a linear collector network for the conversion of the solar energy Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFI-FB-T-81-099] p0030 N82-15367 D0062 A82-18816 HASSACHUSETTS Review of simulation techniques for Aquifer Planning a comprehensive program for exploration of the anthracite deposits of the Barragansett Basin of Massachusetts and Rhode Island, phase 1 Thermal Energy Storage (ATES) [DB81-029943] Computational tools for pulverized-coal combustion and 2 [DE81-028582] p0098 N82-11148 Tennessee Valley Authority atmospheric fluidized-bed combustor simulation [DE81-028490] p0104 N82-11519 Exploration of coal and anthracitic carbonaceous [DB81-028490] shale resources, Narragansètt Basın, Massachusetts, and Rhode Island p0098 N82-11151 [DE81-030262] Vertical combustor for refuse combustion [DE81-030895] p0098 N82-11152 [DE81-030002] Intermediate photovoltaic system application experiment operational performance report.

Volume 2 for Beverly High School, Beverly, Mass.
[DE82-000811] p0077 N82-13532 LLNL underground coal gasification project p0103 N82-11267 [DE81-030634] Irrigation market for solar thermal parabolic dish systems [NASA-CR-164955] MATERIALS HANDLING The storage of hydrogen Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background p0085 A82-17130 p0069 N82-11566 [DE81-030982] Aspects concerning the safety of hydrogen p0085 A82-17132 Study of photovoltaic cost elements. Volume Installation cost model for residential PV Volume 4: Creating a safer environment in US coal mines: The Bureau of Mines Methane Control Program, systems: Users manual p0069 N82-11568 1964-79 [DE81-031921] Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV p0112 N82-13488 [PB81-233918] MATERIALS RECOVERY Ames Laboratory research report, 1980 [DE81-027399] systems: Users manual [DE81-030981] p0161 N82-11012 Aluminum recovery from fly ash and shale-retort RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] wastes p0139 N82-11935 [DE81-027675] SOL-CYCLE: A solar-assisted solvent-recycling process for asphalt-impregnation of fiber board Assessment of pulverized-coal-fired combustor performance [DE81-903377] p0070 N82-11615 Development of a process for recovery of valuable components from complex hydrodesulfurization DE81-0308601 p0105 N82-12187 Investigation of factors affecting the in-situ combustion retorting of oil shale catalysts especially tungsten, mclybdenum, vanadium, nickel and cobalt [DE82-000482] p0106 N82-12200 Analysis report: Applied analysis model summaries [DE81-029278] p0018 N82
The history of the development of the rectenna [BMFT-FB-T-80-186]
Thermal processing of used catalysts
[BMFT-FB-T-80-189] p0018 N82-12526 p0016 N82-12204 p0016 N82-12205 p0149 N82-12560 Power-plant fly-ash utilization: A A theoretical study of microwave beam absorption chemical-processing perspective [DE81-025452] by a rectenna p0022 N82-13191 p0149 N82-12563 Impact of fuel-economy shortfall: Trends in technology-weighted EPA versus on-road EPG. Periodic analysis memorandum no. 1 MATERIALS SCIENCE Solar materials science --- Book p0037 A82-10007 [DE81-030841] p0020 N82-12667 Project impact analysis as an optimal control Introduction to solar materials science p0037 A82-10008 problem --- irrigation and hydroelectric power Introduction to the role of crystal defects in solar materials project [DB81-028465] p0021 N82-12842 p0037 A82-10009 Two-dimensional effects in power take-off region Surface and interface studies and the stability of solid solar energy materials [DE82-000091] p0141 N82-13367 p0037 A82-10010 Materials science issues encountered during the Experimental and analytical investigation of a fluidic power generator development of thermochemical concepts -[JPL-PUB-81-100] p0142 N82-13386 screening of reactions for solar energy Wind speed simulation for economic evaluation of wind energy conversion systems [DB81-030077] applications p0038 A82-10021 p0119 N82-15560 Research opportunities in new energy-related Three-dimensional, finite elemental model for materials simulating heavier-than-air gaseous releases

p0161 A82-15377

over variable terrain

[DB81-028689]

D0032 N82-15602

Methodology and basic algorithms of the Livermore	METAL HYDRIDES
Economic Modeling Systems [DE81-029430] p0035 N82-15833	Lightweight hydrides for automotive storage of
[DE81-029430] p0035 N82-15833 Evaluating R and D options under uncertainty.	hydrogen p0084 A82-11790
Volume 3: An electric-utility	Mechanically stable hydride composites designed
generation-expansion planning model	for rapid cycling
[DE81-904237] p0035 382-16013 MATHEMATICAL PROGRAMMING	p0084 A82-16347 Metal hydrides 1980; Proceedings of the
Focal plane flux distributions produced by solar	International Symposium on the Properties and
concentrating reflectors	Applications of Metal Hydrides, Colorado
p0043 A82-11211 HATRICES (CIECUITS)	Springs, CO, April 7-11, 1980. Volumes 1 & 2 p0085 A82-16784
The design of series-parallel connected thermionic	The storage of hydrogen
converter arrays	p0085 A82-17130
p0124 A82-11820 MECHABICAL DRIVES	Rechargeable metallic hydrides for hydrogen storage p0085 A82-17150
Performance analysis of d.cmotor-photovoltaic	Technical and economic aspects of hydrogen storage
converter system. II - Series and shunt excited	in metal hydrides
motors	[NASA-TH-76610] p0086 N82-11223
p0043 A82-11213 Controlled Speed Accessory Drive demonstration	The storage of hydrogen in the form of metal nydrides: An application to thermal engines
program	[MASA-TM-76609] p0086 M82-11225
[NASA-CR-165010] p0026 N82-13981	HETAL IONS
Automotive fuel economy: Potential improvement through selected engine and differential gear	Assessment of water supply contamination due to
lubricants	underground coal gasification [PB81-209215] p0021 #82-12680
[PB81-240467] p0030 N82-15453	METAL OXIDES
MECHANICAL OSCILLATORS	Investigations on a Se-CdO photovoltaic cell
Dynamic stability of stacked disk tyre flywheels [DE81-030008] p0156 N82-10535	p0132 A82-16052
MECHANICAL PROPERTIES	The emissivity of metals frequency and
Energy and ceramics Book	temperature dependence calculations for solar
P0005 A82-17076	collector design p0038 A82-10014
Health and safety research division	Effect of metal base layer on the absorptance and
[DE81-026088] p0026 N82-13652	emittance of sputtered graded metal-carbon
MELTING	selective absorbing surfaces
Pulverized-coal firing of aluminum melting furnaces [DOB/CS-40037/T2] p0095 N82-10262	p0040 A82-10469 Sputter etched metal solar selective absorbing
MELTING POINTS	surfaces for high temperature thermal collectors
Thermodynamic basis for selecting heat storage	p0057 A82-16057
materials p0153 182-10019	METAL VAPORS Selected studies of four high-temperature
HERCURY CADMIUM TELLURIDES	air-pollution sources
Electrical properties of infrared photovoltaic	p0015 N82-11680
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors	p0015 N82-11680
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466	p0015 N82-11680 HETALLIZING Effects of processing parameters on thick film
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 HERCURY OXIDES Energy storage systems for terrestrial solar	p0015 N82-11680 MBTALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells	p0015 N82-11680 HETALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529	p0015 N82-11680 HBTALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells	p0015 N82-11680 METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032]
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge	p0015 N82-11680 #BFTALLIZING Effects of processing parameters on thick film
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633	p0015 N82-11680 METALLIZING Effects of processing parameters on thick film
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge	p0015 N82-11680 #BFTALLIZING Effects of processing parameters on thick film
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 HERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BHFT-FB-T-81-082] p0080 N82-15529 HETABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 HETAL COATINGS Hetallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA,	p0015 N82-11680 MBTALLIZING Effects of processing parameters on thick film 1 nks used for solar cell front metallization 1 p0058 A82-16474 High resolution, low cost solar cell contact 1 development 1 NASA-CR-165032] 1 p0076 N82-13501 1 pevelopment of an all-metal thick film cost 2 effective metallization system for solar cells 3 (NASA-CR-165043) 2 p0078 N82-14630 MRTEOROLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25. 1980. Volumes 1 & 2	MBTALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METEOBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] p0075 N82-12707
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 HERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BHFT-FB-T-81-082] p0080 N82-15529 HETABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 HETAL COATINGS Hetallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA,	p0015 N82-11680 MBTALLIZING Effects of processing parameters on thick film 1 nks used for solar cell front metallization 1 p0058 A82-16474 High resolution, low cost solar cell contact 1 development 1 NASA-CR-165032] 1 p0076 N82-13501 1 pevelopment of an all-metal thick film cost 2 effective metallization system for solar cells 3 (NASA-CR-165043) 2 p0078 N82-14630 MRTEOROLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METHOROLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METEOROLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Ho/Al203 selective absorber coatings p0060 A82-17253	MBTALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METEOBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METEOBOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] P0111 N82-12731
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METBOEOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METBOEOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] METHANATION
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oride cells [BMFT-FB-T-81-082] METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/No/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production	MBTALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METEOBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METEOBOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] P0111 N82-12731
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Bo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METEOBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] P0075 N82-12707 METEOBOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] P0095 N82-10268
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILES	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METHOROLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METBOROLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Advanced system experimental facility: Solid
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Bo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METEOBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] P0075 N82-12707 METEOBOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] P0095 N82-10268
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/No/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] P0078 N82-14630 METROBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] P0075 N82-12707 METEOBOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] P0111 N82-12731 METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] P0101 N82-11244
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILES Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METHOROLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METBOROLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] p0101 M82-11244 Solar-central-receiver fuels and chemicals
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/No/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] P0078 N82-14630 METROBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] P0075 N82-12707 METEOBOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] P0111 N82-12731 METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] P0101 N82-11244
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-10467	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] P0078 N82-14630 METROBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] P0075 N82-12707 METEOBOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] Solar-central-receiver fuels and chemicals [DE82-000941] PO077 N82-13530 BETHANE Methane production from alkaline food waste
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-10467 Investigations on a Se-CdO photovoltaic cell	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] p0076 N82-13501 Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 METEOROLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] p0075 N82-12707 METEOROLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] p0111 N82-12731 METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] p0101 N82-11244 Solar-central-receiver fuels and chemicals [DE82-000941] p0077 N82-13530 METHANE Methane production from alkaline food waste
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oride cells [BMFT-FB-T-81-082] METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/No/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-10467 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052	MBTALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] p0076 N82-13501 Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 METHOBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] p0075 N82-12707 METEOROLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] p0111 N82-12731 METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] p0101 N82-11244 Solar-central-receiver fuels and chemicals [DE82-000941] p0077 N82-13530 METHANE Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-10467 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 Characterization of selective solar absorber microstructures - Electron microscope studies	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METBOBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METBOBOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] Solar-central-receiver fuels and chemicals [DE82-000941] METHANE Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning
Electrical properties of infrared photovoltaic Cd/x/Bg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oride cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-10467 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254	MBTALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] DATE OR OLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METEOROLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] Solar-central-receiver fuels and chemicals [DE82-000941] DO077 N82-13530 METHANE Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819]
Electrical properties of infrared photovoltaic Cd/z/Hg/1-z/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-10467 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254 Development of an all-metal thick film cost	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METEOBOLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METEOBOLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] Solar-central-receiver fuels and chemicals [DE82-000941] METHANE Methane production from alkaline food waste P0077 N82-13530 METHANE Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] Production and utilization of methane from
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-8+082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-100467 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254 Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METEOROLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METEOROLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] Solar-central-receiver fuels and chemicals [DE82-000941] METHANB Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants
Electrical properties of infrared photovoltaic Cd/x/ig/1-x/Te detectors p0136 A82-18466 BBRCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-81-082] p0080 N82-15529 BETABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 BETAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited A1203/Ho/A1203 selective absorber coatings p0060 A82-17253 METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 BETAL FILES Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-10467 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 Characterization of selective solar absorber microstructures - Electron microscope studies p060 A82-17254 Development of an all-metal thick film cost effective metallization system for solar cells [MASA-CR-165043] Low-cost mirror concentrator based on inflated,	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] METEOROLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] METEOROLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] Solar-central-receiver fuels and chemicals [DE82-000941] METHANE Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DE81-029958] P0101 N82-11246
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 MERCURY OXIDES Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells [BMFT-FB-T-8+082] p0080 N82-15529 METABOLIC WASTES Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 METAL COATINGS Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 Sputter-deposited Al203/Mo/Al203 selective absorber coatings METAL COMPOUNDS Solar chemistry of metal complexes hydrogen production p0058 A82-16124 METAL FILMS Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-100467 Investigations on a Se-CdO photovoltaic cell p0132 A82-16052 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254 Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630	METALLIZING Effects of processing parameters on thick film inks used for solar cell front metallization p0058 A82-16474 High resolution, low cost solar cell contact development [NASA-CR-165032] p0076 N82-13501 Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 METEOROLOGICAL PARAMETERS Environmental data for sites in the National Solar Data Network [DE82-000071] p0075 N82-12707 METEOROLOGY Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] p0111 N82-12731 METHANATION Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] p0095 N82-10268 Advanced system experimental facility: Solid waste to methane gas. Background and process description [DE81-030198] p0101 N82-11244 Solar-central-receiver fuels and chemicals [DE82-000941] p0077 N82-13530 METHANE Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE61-023819] p0095 N82-10267 Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants

Design, construction, and operation of a full	MICROWAVE CIRCUITS
scale experimental anaerobic fermentation facility [DE81-029028] p0110 N82-12605	International Microwave Symposium, Los Angeles, CA, June 15-19, 1981, Proceedings
Creating a safer environment in US coal mines:	p0 146 A82-17976
The Bureau of Mines Methane Control Program,	MICROWAVE RQUIPMENT
1964-79	International Microwave Symposium, Los Angeles,
[PB81-233918] p0112 W82-13488	CA, June 15-19, 1981, Proceedings p0146 A82-17976
Solar-central-receiver fuels and chemicals [DE82-000941] p0077 N82-13530	The adapting of the crossed-field directional
Blomethanation of biomass pyrolysis gases	amplifier to the requirements of the SPS
[DB82-000238] p0113 882-13541	p0148 N82-12554
Assessment of in-place solution methane in	MICROVAVE TRANSMISSION
tertiary sandstones: Texas Gulf Coast	Solar power satellite microwave power transmission
[DE81-029772] p0117 N82-15225 High-pressure solvent extraction of methane from	and reception system p0145 A82-11743
geopressured fluids	Microwave power transmission by satellites
[DE81-027713] p0117 N82-15227	p0145 A82-12503
Three-dimensional, finite elemental model for	Mechanical and nonlinear effects in microwave
simulating heavier-than-air gaseous releases	power transmission
over variable terrain [DE81-028689] p0032 N82-15602	p0145 A82-12504 Space chamber experiments of ohmic heating by high
[DE81-028689] p0032 N82-15602 MRTHODOLOGY	power microwave from the Solar Power Satellite
Implementation of a siting methodology for utility	P0145 A82-16991
size WECS in western Massachusetts and	International Microwave Symposium, Los Angeles,
northwestern Connecticut	CA, June 15-19, 1981, Proceedings
[AIAA PAPER 81-2540] p0091 A82-14008	p0146 A82-17976
METHIL ALCOHOLS Supercritical multicomponent solvent coal extraction	Status of the microwave power transmission components for the solar power satellite
[NASA-CASE-NPO-15767-1] p0107 N82-12241	p0146 A82-17982
Project for reliability fleet testing of	Investigation of direct solar-to-microwave energy
alcohol/gascline blends	conversion techniques
[DE82-000004] p0107 N82-12250	[NASA-CR-161883] p0067 N82-11544
Investigation of the in-situ oxidation of methanol in fuel cells	Workshop on Microwave Power Transmission and Reception. Workshop paper summaries
[AD-A105947] p0143 N82-14642	[NASA-TM-84064] p0146 N82-12538
The utilisation of alcohol in light duty diesel	System performance conclusions
engines	p0146 N82-12539
[PB81-244469] p0118 N82-15452	SPS large array simulation
ABTHYL COMPOUNDS Dimethyl sulfate in particulate matter from coal-	p0071 N82-12540 An active alignment scheme for the MPTS array
and oil-fired power plants	p0 147 M82-12541
p0005 A82-16199	Ionospheric power beam studies
RETHYLENB	p0147 N82-12542
Coal hydrogenation via bonding of metallic	Proposed experimental studies for assessing
compounds to coal, part 1. Solubilization of	ionospheric perturbations on SPS uplink pilot
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical	ionospheric perturbations on SPS uplink pilot beam signal
compounds to coal, part 1. Solubilization of	ionospheric perturbations on SPS uplink pilot
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO	ionospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems	ionospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DB81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico	ionospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems	ionospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506	ionospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm	ionospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility	ionospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the	ionospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Harket assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies p0147 N82-12549
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Harket assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Harket assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE61-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 NEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 NICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Harket assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies p0147 N82-12548 SPS fiber optic link assessment p0147 N82-12559 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 NEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 NICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [EES-E-276] p0097 N82-10735	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS phase control studies sPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design halytic investigation of efficiency and performance limits in klystron amplifiers using
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Harket assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies p0147 N82-12548 SPS fiber optic link assessment p0147 N82-12559 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 NEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 NICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [EBS-E-276] p0097 N82-10735 A central microprocessor controlled electrical	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies p0147 N82-12548 SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 NEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 NICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 NICROOMEGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSOBS Microprocessor applications for the monitoring and control of gas supplies [EES-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMFT-F8-T-80-182] p0025 N82-13547 MICROSTRUCTURE	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12559 Lonospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [EES-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BHFT-FB-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [EES-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMFT-FB-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies p0147 N82-12548 SPS fiber optic link assessment p0147 N82-12559 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [EES-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BHFT-FB-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [EBS-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMFT-FB-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers P0037 A82-10011 Characterization of selective solar absorber	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12551 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 SPS antenna element evaluation
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [EES-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMFT-FB-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers D0037 A82-10011 Characterization of selective solar absorber microstructures - Electron microscope studies	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p1147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies p0147 N82-12548 SPS fiber optic link assessment p0147 N82-12559 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12551 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 SPS antenna element evaluation p0148 N82-12555 The Besonant Cavity Radiator (ECR)
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSOBS Microprocessor applications for the monitoring and control of gas supplies [EES-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMT-FB-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers p0037 A82-10011 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12559 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12555 SPS antenna element evaluation p0148 N82-12555 The Resonant Cavity Radiator (RCR)
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [EBS-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMFT-FB-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers p0037 A82-10011 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12551 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 SPS antenna element evaluation p0148 N82-12555 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Evaluation of thick wall wave guide element
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSOBS Microprocessor applications for the monitoring and control of gas supplies [EES-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMT-FB-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers p0037 A82-10011 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12559 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12555 SPS antenna element evaluation p0148 N82-12555 The Resonant Cavity Radiator (RCR)
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 NEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 NICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 NICROORGANISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [ERS-R-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMFT-FR-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers p0037 A82-10011 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254 MICROBAVE ANTENNAS Solar power satellite microwave power transmission and reception system	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator SPS phase control studies SPS phase control studies SPS phase control studies SPS fiber optic link assessment p0147 N82-12548 SPS fiber optic link assessment p0147 N82-12554 SPS fiber optic link active retrodirective array and mitigating system design p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design p0148 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 SPS antenna element evaluation p0148 N82-12555 The Resonant Cavity Radiator (RCB) p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thun-walled slotted waveguide arrays for the SPS
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGAMISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [ERS-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMFT-FR-80-182] p0025 N82-13547 MICROSTBUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers p0037 A82-10011 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254 MICROWAVE ANTENNAS Solar power satellite microwave power transmission and reception system p0145 A82-11743 Antenna optimization and cost consideration for	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS phase control studies SPS phase control studies p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12559 Ligh efficiency SPS klystron design p0148 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 SPS antenna element evaluation p0148 N82-12555 The Resonant Cavity Radiator (RCE) p0148 N82-12556 Evaluation of thick wall wave guide element p0148 N82-12556 Evaluation forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAM Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGAMISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROORGORSSORS Microprocessor applications for the monitoring and control of gas supplies [ERS-R-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMFT-FB-T-80-182] p0025 N82-13547 MICROSTRUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers P0037 A82-10011 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254 MICROWAVE ANTENNAS Solar power satellite microwave power transmission and reception system P0145 A82-11743 Antenna optimization and cost consideration for the Solar Power Satellite microwave system	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies spo 147 N82-12548 SPS phase control studies p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Ionospheric effects in active retrodirective array and mitigating system design p0147 N82-12551 High efficiency SPS klystron design p0148 N82-12551 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12555 SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12556 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 Considerations for high accuracy radiation
compounds to coal, part 1. Solubilization of Illinois bituminous coal - the critical importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236 MEXICO Market assessment of photovoltaic power systems for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506 MICHIGAN Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MICROORGAMISMS Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 MICROPROCESSORS Microprocessor applications for the monitoring and control of gas supplies [ERS-E-276] p0097 N82-10735 A central microprocessor controlled electrical storage heating system [BMFT-FR-80-182] p0025 N82-13547 MICROSTBUCTURE The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers p0037 A82-10011 Characterization of selective solar absorber microstructures - Electron microscope studies p0060 A82-17254 MICROWAVE ANTENNAS Solar power satellite microwave power transmission and reception system p0145 A82-11743 Antenna optimization and cost consideration for	lonospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies SPS phase control studies p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12559 Ligh efficiency SPS klystron design p0148 N82-12551 High efficiency SPS klystron design p0148 N82-12552 Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 The adapting of the crossed-field directional amplifier to the requirements of the SPS p0148 N82-12554 SPS antenna element evaluation p0148 N82-12555 The Resonant Cavity Radiator (RCE) p0148 N82-12556 Evaluation of thick wall wave guide element p0148 N82-12556 Evaluation forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558

MICROWAVES SUBJECT INDEX

The history of the development of the rectenna p0149 N82-12560	Extensible bridge-conveyor concepts for coal-mine face haulage
Rectenna system design	[DE81-031974] p0146 N82-12525
p0149 N82-12561 Rectenna session: Micro aspects	Longwall mining of thin seams [DE81-028042] p0116 N82-14612
p0149 N82-12562	MINUESOTA POTTO NOZ 14012
A theoretical study of microwave beam absorption	Wood resources and utilization patterns in the North Central Region and energy needs for the
by a rectenna p0149 N82-12563	manufacture of wood products
Rectenna array measurement results p0149 N82-12564	[DE81-030356] p0019 N82-12604 Development of peatlands in northern Minnesota
Session on solid state: Introduction	[DE82-000873] p0112 N82-13475
p0149 N82-12565 Modified reference SPS with solid state	MINORITY CARRIERS Dependence of minority carrier diffusion length on
transmitting antenna	illumination level and temperature in single
p0149 N82-12566 SPS solid state antenna power combiner	crystal and polycrystalline Si solar cells p0053 A82-13804
p0149 N82-12567	Effect of junction depth on the performance of a
Solid-state retrodirective phased array concepts for microwave power transmission from Solar	diffused n/+/p silicon solar cell p0056 A82-15444
Power Satellite	A method for experimental assessment of the
p0149 N82-12568 Effects of the Satellite Fower System on low Earth	shifting approximation, with application to polysulicon solar cells effect of constant
orbit and geosynchronous satellites	series resistance
[PB81-232019] p0150 N82-13157 HICROWAYES	p0058 A82-16131
Chronic exposure of a honey bee colony to 2.45 GHz	Solar mirror materials - Their properties and uses
continuous wave microwaves p0003 A82-14347	in solar concentrating collectors
HILITARY AIR FACILITIES	The effect of soiling on solar mirrors and
Geothermal-resource verification for Air Porce Bases [DB81-027482] p0112 N82-13520	techniques used to maintain high reflectivity p0037 A82-10013
MILITARY SPACECRAFT	Fundamental limits to the spectral selectivity of
Thermionic application for future air force space power systems	<pre>composite materials for absorbing solar radiation</pre>
p0124 A82-11822	p0038 A82-10015 Composite film selective-absorbers for solar
Ethanol production in southern tier east region of	radiation collection
New York: Technical and economic feasibility [PB81-226979] p0011 N82-11275	p0038 A82-10016 Investigation of abrasive action of atmospheric
HINERAL DEPOSITS	particles on the reflectance of mirrors
Geology of the nahcclite deposits and associated oil shales of the Green River Poination in the	p0040 A82-10388 Hathematical simulation model for the operation of
Piceance Creek Basın, Colorado	the optical system of a solar power station
p0105 N82-11683	p0053 A82-13718 Fracture mechanics of cellular glass
Planning a comprehensive program for exploration of the anthracite deposits of the Narragansett	[NASA-CR-164959] p0066 N82-11209 Secondary and compound concentrators for parabolic
Basin of Massachusetts and Bhode Island, phase 1	dish solar thermal power systems
and 2 [DR81-028490]	[NASA-CR-164960] p0068 N82-11550
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping	Low-cost mirror concentrator based on inflated, double-walled, metallized, tubular films
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Hyoming; Cubeza	Low-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Nyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 HIS (SEMICOMDUCTORS) Temperature dependence of the short-circuit
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Myoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SENICOBDUCTORS)
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Hyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SENICOEDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SEMICOMDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Nyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MIMERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Nyoming:	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SEMICOMDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Nyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Nyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SEMICOMDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINERS	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 HIS (SENICONDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MIMERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MIMES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SEMICONDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 M82-15551 MIS (SEMICOBDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (BXCAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 M82-15551 MIS (SENICOEDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Nyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (EXCAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131]	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 HIS (SENICOEDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 HISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 HISSOURI
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (BXCAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] Suppression of coal dust explosion by water	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 M82-15551 MIS (SEMICOBDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MIMERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (EXCAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] p0015 N82-11712 Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306]	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SEMICOEDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MISSOURI BIVER (US) Synthetic fuel development for the Upper Missouri
GDE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Nyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (EXCAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] MINING	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 M82-15551 MIS (SEMICOBDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] MISSOURI RIVER (US) Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report
GDE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (RICAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground ccal gasification [DE81-027131] p0015 N82-11712 Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] p0024 N82-13489 MINING Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SENICOEDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MISSOURI RIVER (US) Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] p0011 N82-11276
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (BXCAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] p0024 N82-13489 MINING Feasibility of a small scale pumped storage	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 M82-15551 MIS (SEMICOBDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MISSOURI BIVER (US) Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537]
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (EXCAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] p0024 N82-13489 MINING Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] p0155 N82-10525 Geologic considerations in underground coal mining system design	LOW-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 M82-15551 MIS (SENICOEDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MISSOURI RIVER (US) Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] p0011 N82-11276 MOBILITY Low-cost passive-solar retrofits for new and existing mobble homes [DE81-028356] p0081 N82-15544
[DE81-028490] p0104 N82-11519 Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (BXCAVATIOMS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] p0015 N82-11712 Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] p0024 N82-13489 MINING Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] p0155 N82-10525 Geologic considerations in underground coal mining	LOW-COST MITTOR CONCENTRATOR based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 M82-15551 MIS (SEMICOBDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MISSOURI BIVER (US) Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] p0011 N82-11276 MOBILITY Low-cost passive-solar retrofits for new and existing mobile homes
GDE81-028490] Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] Diagnochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DINES Evaluation of novel underground transport systems [DE81-030279] DE81-030279] DINES (EXCAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification [DE81-027131] Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB61-233306] Peasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] Geologic considerations in underground coal mining system design [NASA-CR-164961] Energy analysis of human ecosystems in an Appalachian coal county	LOW-COST MITTOR CONCENTRATOR based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 M82-15551 MIS (SEMICOBDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MISSOURI BIVER (US) Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] p0011 N82-11276 MOBILITY Low-cost passive-solar retrofits for new and existing mobile homes [DE81-028356] p0081 N82-15544 MODULATORS Solar energy modulator [NASA-CASE-NPO-15388-1] p0063 N82-10496
Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] polis N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] poli60 N82-15558 MIMERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] poli10 N82-12693 MIMES Evaluation of novel underground transport systems [DE81-030279] poli46 N82-12520 MIMES (BXCAVATIOMS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground ccal gasification [DE81-027131] poli5 N82-11712 Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] poli55 N82-13489 MIMING Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] poli55 N82-10525 Geologic considerations in underground coal mining system design [NASA-CR-164961] poli04 N82-11516 Energy analysis of human ecosystems in an Appalachian coal county [DE81-025177] poli3 N82-11574 Peasibility analysis of trench strip and auger	LOW-COST MITTOR CONCENTRATOR based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SENICOBDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MISSOURI BIVER (US) Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] p0011 N82-11276 MOBILITY Low-cost passive-solar retrofits for new and existing mobile homes [DE81-028356] p0081 N82-15544 MODULATORS Solar energy modulator [NASA-CASE-NPO-15388-1] p0063 N82-10496 MODULATORS Solar energy modulator [NASA-CASE-NPO-15388-1] p0063 N82-10496 MOLECULAR BEAM EPITALY A new low temperature III-V multilayer growth
Geologic applications of thermal-inertia mapping from satellite Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558 MINERAL METABOLISM Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 MINES Evaluation of novel underground transport systems [DE81-030279] p0146 N82-12520 MINES (RICAVATIONS) Computer models to support investigations of surface subsidence and associated ground motion induced by underground ccal gasification [DE81-027131] p0015 N82-11712 Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] p0024 N82-13489 MINING Feasibility of a small scale pumped storage demonstration project, Hibbing, Minnesota [DE81-028678] p0155 N82-10525 Geologic considerations in underground coal mining system design [NASA-CR-164961] p0104 N82-11516 Energy analysis of human ecosystems in an Appalachian coal county [DE81-025177] p0013 N82-11574	LOW-COST MITTOR CONCENTRATOR based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 MIS (SENICOEDUCTORS) Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 A pinhole model for metal-insulator-semiconductor solar cells p0056 A82-15442 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 MISSILE SILOS Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 MISSOURI Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 MISSOURI RIVER (US) Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] p0011 N82-11276 MOBILITY LOW-cost passive-solar retrofits for new and existing mobile homes [DE81-028356] p0081 N82-15544 HODULATORS Solar energy modulator [NASA-CASE-NPO-15388-1] p0063 N82-10496

SUBJECT IEDRX EITRATES

Soot formation in synfuels	Environmental research plan for gas supply technologies. Volume 1: Executive summary
[DE81-030273] p0099 N82-11164	[PB81-222309] p0015 N82-11657
MOLTEN SALT BLECTROLYTES	Fuel savings in hot water heating plants by
Rechargeable molten-salt cells	application of heat pumps operated with natural
[DE81-027091] p0158 N82-11595 MOLTEN SALTS	gas (natural gas heat pump). Project: gas engine [BMFT-FB-T-80-125] p0020 N82-12641
Development of a solar thermal central heat	Natural gas plan needed to provide greater
receiver using molten salt	protection for high-priority and critical uses
[ASME PAPER 81-SOL-2] p0041 A82-10970	[PB81-228488] p0023 N82-13255
Molten salt thermal energy storage subsystem for Solar Thermal Central Receiver plants	Development of a metal hydride process for hydrogen recovery from supplemented natural gas
p0047 A82-11780	[DE81-022685] p0086 N82-14382
Molten-salt coal-gasification process development	International energy indicators
unit, phase 2	[DE81-028117] p0028 N82-14653
[DE81-023585] p0094 N82-10251 MOLYBDENUM	NATURAL GAS EXPLORATION Sulfur pollution control. Phase 1: The disposal
Sputter-deposited Al203/Mo/Al203 selective	program (sections 5 through 7)
absorber coatings	[PB81-222804] p0015 N82-11655
p0060 A82-17253 Synthesis gas conversion to liquid fuels using	Evaluation of Devonian shale potential in eastern
promoted fused iron catalysts	Kentucky/Tennessee [DE82-001164] p0116 N82-14595
[DE81-030857] p0108 N82-12259	NETWORK ANALYSIS
HOLYBDENUM DISULPIDES	Calculation of the top loss coefficient by the
Investigation of the performance of an MoS2/I-/I2/C electrochemical solar cell	network method and applications to solar collectors
p0053 A82-13805	p0056 A82-15653
HOLYBDENUM SULPIDES	HEVADA
Photoelectrochemical cells using polycrystalline	Low-to-moderate temperature geothermal resource
and thin film MoS2 electrodes p0057 A82-16053	assessment for Nevada, area specific studies [DE81-030487] p0096 N82-10475
MOMBET DISTRIBUTION	Geothermal reservoir assessment: Northern basin
An indoor blade test facility for determining the	and range province Stillwater prospect,
basic aerodynamic properties of Darrieus wind	Churchill County, Nevada
turbine airfoils with test results for an NACA 0015 and a modified section	[DE82-000529] p0109 N82-12516
p0136 N82-10005	Schlumberger resistivity study of the Jemez
MONITORS	Springs region of northwestern New Mexico
Microprocessor applications for the monitoring and control of gas supplies	[DE81-025302] p0119 N82-15661
[ERS-E-276] p0097 N82-10735	Ethanol production in southern tier east region of
HONTAWA	New York: Technical and economic feasibility
Peasibility and economic study of medium-Btu coal	[PB81-226979] p0011 N82-11275
gas blended with high-Btu by-product gas as an industrial energy source at Billings, Montana	BRWS MRDIA Progress report to the Department of Energy in
[DE81-030622] p0107 N82-12254	support of basic energy and policy research
Environmental effects of collutants from coal	[DE81-025882] p0028 N82-14648
COmbustion. 2: The Colstrip, Montana Power Plant [PB81-234114] p0026 N82-13573	BICKBL ALLOYS Forkshop progeodings: Webond tube gracking in
HOROCCO	Workshop proceedings: U-bend tube cracking in steam generators
Market assessment of photovoltaic power systems	[DE81-903765] p0142 N82-13515
for agricultural applications in Morocco	NICKEL COATINGS
[NASA-CR-165477] p0077 N82-14627 NX MISSILE	Characterization of selective solar absorber microstructures - Electron microscope studies
Configuration selection study for isclated loads	p0060 A82-17254
using parabolic dish modules	NICKEL COMPOUNDS
[AIAA PAPER 81-2549] p0061 A82-18223	Nickel sulphide-lead sulphide and nickel sulphide-cadmium sulphide selective coatings for
N	solar thermal conversion
IA	p0059 A82-16745
N-TYPE SEMICONDUCTORS Photoelectrochemical sclar cells: Stabilization	NICKEL HYDROGEN FATTERIES The nickel-hydrogen battery system - An historical
of small-band-gap semiconductor in aqueous	Overview
solution by surface-attached organic conducting	p0153 A82-11735
polymer	NICKEL ZINC BATTERIES
[DE81-030312] p0081 N82-15569 NAPHTHENES	Near-term batteries for electric vehicles [DE81-023543] p0157 N82-10556
Thermolysis of naphthols	Investigation of the zinc electrode reaction
[DE81-029684] p0116 N82-15152	nickel zinc batteries
NASA PROGRAMS Advances in space power research and technology at	[DE81-030221] p0157 N82-11368 Development of battery separator composites
the National Aeronautics and Space Administration	[NASA-CR-165508] p0157 N82-11547
p0122 A82-11755	BICKEL-IBON BATTERIES
Lewis Research Center's coal-fired, pressurized, fluidized-bed reactor test facility	Near-term batteries for electric vehicles [DB81-023543] p0157 N82-10556
[NASA-TH-81616] p0103 N82-11397	NIGERIA
NATURAL GAS	Oil and gas industry and environmental pollution:
Microprocessor applications for the monitoring and control of gas supplies	Application of systems reliability analysis for
[ERS-E-276] p0097 N82-10735	the evaluation of the status of environmental pollution control in the Nigerian petroleum
Brayton/Rankine 10-ton gas-fired space	industry
conditioning system, phase 2	p0008 N82-10583
[PB81-223372] p0139 N82-11478 Petroleum geology and resource assessment of the	NITRATES Development of a solar thermal central heat
middle Caspian Basın, USSR, with special	receiver using molten salt
emphasis on the Uzeu field	[ASME PAPER 81-SOL-2] p0041 A82-10970
[DE81-029951] p0104 N82-11518	

WITRIC OXIDE	ROZZLE FLOW
Pundamentals of nitric oxide formation in	Experimental and analytical investigation of a
fossil-fuel combustion	fluidic power generator
[DE81-030329] p0033 N82-15608	[JFL-POB-81-100] p0142 N82-13386
Synthesis gas conversion to liquid fuels using	Nuclear electric power for space systems -
promoted fused iron catalysts	Technology background and flight systems program
[DE81-030857] p0108 882-12259	p0 123 A82-11756
BITROGEN	International energy indicators
Characterization of diesel emissions as a function	[DE81-028117] p0028 N82-14653
of fuel variables [PB81-244048] p0118 N82-15233	<pre>Failure mode analysis using state variables derived from fault trees with application</pre>
BITROGEE OXIDES	[DE81-030239] p0144 #82-15454
Kinetics of NO/ sub x formation during early	NUCLEAR BLECTRIC PROPULSION
stages of pulverized-coal combustion	Heat pipes for NEP spacecraft radiators
[DE81-029071] p0014 N82-11641	p0122 A82-11748
Control of utility boiler and gas turbine	Advanced high temperature thermoelectrics for
pollutant emissions by combustion modification, phase 2	space power p0125 A82-11823
[PB81-222267] p0015 N82-11654	BUCLEAR EMERGY
Fuel nitrogen conversion during fuel rich	Energy for the year 2000 Book
combustion of pulverized coal and char	p0006 A82-18120
p0105 N82-12156	NUCLBAR PUBLS
Low NO sub x heavy fuel combustor concept program	Application of different KPA-models in the
[NASA-CR-165512] p0140 N82-12572 Testing and evaluation of MHD materials and	framework of the energy research programme of the European Communities
substructures	[EUR-6758-EN] p0019 N82-12597
[DE81-024331] p0143 N82-13926	Space nuclear safety and fuels program
Kinetics of reactions in a wet flue gas	p0111 N82-12921
simultaneous desulfurization and denitrification	Value tree analysis of energy supply alternatives
system	[AD-A105629] p0029 N82-14875 NUCLEAR FUSION
[DE81-029853] p0033 N82-15607 WITROSIL CHLORIDES	Pusion as a source of synthetic fuels
Brayton cycle using dissociating nitrosyl chloride	[BNL-29281] p0086 N82-11257
p0126 A82-11852	Technology of controlled nuclear fusion
HOISE REDUCTION	[DE81-027361] p0144 N82-15893
Establishment of noise acceptance criteria for	NUCLEAR HEAT
wind turbines p0125 A82-11825	Application of HTGR process heat to oil shale retorting
Analysis of integrated fuel-efficient, low-noise	p0090 A82-11851
procedures in terminal-area operations	NUCLEAR POWER PLANTS
[DE81-029833] p0022 H82-13014	Low-level radioactive waste: An introductory
HONEQUILIBRIUM THERMODYNAMICS	overview
Is geothermal simulation a catastrophe?	[DE81-026334] p0022 N82-12924
[DE81-026750] p0105 N82-11588 NONLINEAR EQUATIONS	The nuclear controversy: Unequal competition in public policy-making
Nonlinear development of magnetic reconnection in	[ERG-035] p0027 N82-14626
the tearing-type and the Petschek-type field	
geometries	<pre>Ecological effects assessment: Requirements vs state-of-the-art</pre>
geometries p0132 A82-17015	Ecological effects assessment: Requirements vs state-of-the-art [DE01-020092] p0032 N82-15598
geometries p0132 A82-17015 HOBLIBEARITY	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS
geometries p0132 A82-17015 BONLINGARITY Mechanical and nonlinear effects in microwave	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based
geometries p0132 A82-17015 BOBLIBBARITY Mechanical and nonlinear effects in microwave power transmission	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations
geometries p0132 A82-17015 BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUSIFORM PLOS .	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory
geometries p0132 A82-17015 HOBLIBEARTY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 HONUBIFORM PLOW Effect of inhomogeneous flow distribution in a	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview
geometries p0132 A82-17015 BOBLIBBARTY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUBIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors	Ecological effects assessment: Requirements vs state-of-the-art [DB81-026092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0 145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924
geometries p0132 A82-17015 BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUNIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423	Ecological effects assessment: Requirements vs state-of-the-art [DB81-026092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLBAR REACTORS
geometries p0132 A82-17015 HOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 HONUMIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space
geometries p0132 A82-17015 BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUNIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423	Ecological effects assessment: Requirements vs state-of-the-art [DB81-026092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLBAR REACTORS
geometries p0132 A82-17015 BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUBLYORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 BORTH CAROLIBA Peat deposits of Dismal Swamp pocosins: Cawden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822
geometries p0132 A82-17015 BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BONUNIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 BORTH CAROLINA Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Ferquimans Counties, North Carolina [DE81-029642] p0109 N82-12524	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBRICAL ANALYSIS The effect of variable fluid properties on scale
geometries p0132 A82-17015 BOBLIBEARTY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUBLIPOR PLON Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 HORTE CAROLIBA Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] BORTH DAKOTA	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLBAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers
geometries p0132 A82-17015 BOBLIBEARTY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUBLYORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 HOBTH CAROLIBA Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] BOBTH DAKOTA Great Plains gasification project, Mercer County,	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269
geometries p0132 A82-17015 BOBLIBEARTY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUBLIPOR PLON Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 HORTE CAROLIBA Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans Counties, North Carolina [DE81-029642] BORTH DAKOTA	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLBAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers
geometries p0132 A82-17015 BOBLIBBARTY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUBLYORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 BOBTH CABOLIBA Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Ferquimans Counties, North Carolina [DE81-029642] BOBTH DAKOTA Great Plains gasification project, Mercer County, Borth Dakota; water assessment report section	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 BUMBRICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind
geometries p0132 A82-17015 BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 BOBUBIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 HOBTH CAROLIBA Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Ferquimans Counties, North Carolina [DE81-029642] BOBTH DAKOTA Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, BOO13 N82-11524 Great Plains gasification project, Mercer County, BOO13 N82-11524 Great Plains gasification project, Mercer County, BOO13 N82-11524	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBRICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a
geometries #ONLINEARITY Mechanical and nonlinear effects in microwave power transmission #ONUBIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 **MORTH CAROLINA** Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Ferquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 **MORTH DAKOTA** Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13 (c) [PB81-216111] p0013 N82-11524 Great Plains gasification project, Mercer County, North Dakota; water assessment report	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar
geometries p0132 A82-17015 #OBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 #ONUBIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 **HORTH CAROLINA** Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Ferguimans Counties, North Carolina [DE81-029642] p0109 N82-12524 **HORTH DAKOTA** Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] p0013 N82-11524 Great Plains gasification project, Mercer County, North Dakota; water assessment report section 1981-216129] p0013 N82-11525	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DB81-026334] p0022 N82-12924 NUCLBAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage
geometries #OBLINEARITY Mechanical and nonlinear effects in microwave power transmission #OWUNIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 **HORTH CAROLINA** Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Ferquimans Counties, North Carolina [DE81-029642] **HORTH DAKOTA** Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13 (c) [PB81-216111]	Ecological effects assessment: Requirements vs state-of-the-art [D881-028092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [D881-026334] p0022 N82-12924 NUCLBAR BEACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage
geometries #OBLINEARITY Mechanical and nonlinear effects in microwave power transmission #ONUNIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 **NORTH CAROLINA** Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Ferquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 **NORTH DAKOTA** Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] p0013 N82-11524 Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] p0013 N82-11525 Status of the Great Plains coal gasification plant [EMD-81-64] wood resources and utilization patterns in the	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DB81-026334] p0022 N82-12924 NUCLBAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage
### BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DB81-026334] p0022 N82-12924 NUCLBAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage p0061 A82-18232 NUMERICAL CONTROL Optical diagnostic techniques for coal-fired MHD applications
### BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBRICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMBRICAL CONTROL Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913
## BONLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMERICAL CONTROL Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913 Design study of a continuously variable roller
### BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMERICAL CONTROL Optical diagnostic techniques for coal-fired MBD applications [AIAA PAPER 82-0377] p0135 A82-17913 Design study of a continuously variable roller cone traction CVT for electric vehicles
## BONLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0 145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0 124 A82-11822 NUMBRICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0 132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMBRICAL CONTROL Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913 Design study of a continuously variable roller cone traction CVT for electric vehicles [NASA-CR-159841] p0159 N82-12445 Vertical-axis wind-turbine control strategy
BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission BONUBIFORM PLOW Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 HORTH CAROLINA Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Ferquimans Counties, North Carolina [DE81-029642] p0109 N82-12524 HORTH DAKOTA Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13 (c) [PB81-216111] p0013 N82-11524 Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] p0013 N82-11525 Status of the Great Plains coal gasification plant [END-81-64] p0107 N82-12242 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 HORTHERN HEMISPHERE The annual variation of atmospheric CO2 concentration observed in the Northern Hemisphere p0002 A82-12156	Ecological effects assessment: Requirements vs state-of-the-art [DE81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMERICAL CONTROL Optical diagnostic techniques for coal-fired MED applications [AIAA PAPER 82-0377] p0135 A82-17913 Design study of a continuously variable roller cone traction CVT for electric vehicles [NASA-CR-159841] p0159 N82-12445 Vertical-axis wind-turbine control strategy [DE81-031932] p0141 N82-12591
### BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLBAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DB81-026334] p0022 N82-12924 NUCLBAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMERICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMERICAL COMPTROL Optical diagnostic techniques for coal-fired MBD applications [AIAA PAPER 82-0377] p0135 A82-17913 Design study of a continuously variable roller cone traction CVT for electric vehicles [NASA-CR-159841] vertical-axis wind-turbine control strategy [DE81-031932] BURREICAL PLOW VISUALIZATION
### BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBRICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMERICAL CONTROL Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913 Design study of a continuously variable roller cone traction CVT for electric vehicles [NASA-CR-159841] p0159 N82-12445 Vertical-axis wind-turbine control strategy [DE81-031932] p0141 N82-12591 NUMERICAL FLOW VISUALIZATION A numerical model for the flow within the tower of
### BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBRICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMBRICAL CONTROL Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913 Design study of a continuously variable roller cone traction CVT for electric vehicles [NASA-CR-159841] p0159 N82-12445 Vertical-axis wind-turbine control strategy [DE81-031932] NUMBRICAL FLOW VISUALIZATION A numerical model for the flow within the tower of a tornado-type wind energy system
### BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBRICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMERICAL CONTROL Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913 Design study of a continuously variable roller cone traction CVT for electric vehicles [NASA-CR-159841] p0159 N82-12445 Vertical-axis wind-turbine control strategy [DE81-031932] p0141 N82-12591 NUMERICAL FLOW VISUALIZATION A numerical model for the flow within the tower of
### BOBLINEARITY Mechanical and nonlinear effects in microwave power transmission P0145 A82-12504	Ecological effects assessment: Requirements vs state-of-the-art [DB81-028092] p0032 N82-15598 NUCLEAR POWER REACTORS Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 NUCLEAR REACTORS Thermionic application for future air force space power systems p0124 A82-11822 NUMBRICAL ANALYSIS The effect of variable fluid properties on scale modeling of solar central receivers p0049 A82-12269 Computational analysis of diffuser-augmented wind turbines p0132 A82-16743 Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage NUMBRICAL CONTROL Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913 Design study of a continuously variable roller cone traction CVT for electric vehicles [NASA-CR-159841] p0159 N82-12445 Vertical-axis wind-turbine control strategy [DE81-031932] NUMBRICAL FLOW VISUALIZATION A numerical model for the flow within the tower of a tornado-type wind energy system

0	Plan for technological research and development related to the petroleum activities on the
A44888	Norwegian Continental Shelf. 1981-1985:
OCCUPATION Properties and training inclinations of biomass	Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs
Education and training implications of biomass energy system use	[DE81-904014] p0104 N82-11520
[DE81-029956] p0028 N82-14664	Oceans and ocean currents: Their influence on
OCEAN BOTTOM	climate
Maritime support for ocean-resources development	[DE81-027263] p0016 H82-11731
[AD-A104730] p0111 N82-12735	Environmental assessment of the Alaskan
OCEAN CURRENTS	Continental Shelf: Annual reports of principal
Turbines in the ocean	investigators for the year ending March 1980. Volume 5: Hazards
p0132 A82-16844 Ocean energy-waves, currents, and tides	[PB81-225732] p0026 N82-13607
[DB81-025708] p0105 N82-11611	Offshore petroleum industry environmental data
Oceans and ocean currents: Their influence on	requirements: Emphasis on remote sensing
climate	p0027 N82-14557
[DE81-027263] p0016 N82-11731	The Seasat commercial demonstration program
OCEAH DATA ACQUISITIONS SYSTEMS	p0115 N82-14561
Relational methodology for integrating and	OFFSHORE REACTOR SITES
analyzing field test and research data	Alternate hybrid power sources for remote site
describing enhanced cil recovery [DB81-030441] p0118 #82-15508	applications [AD-AJ99471] p0024 N82-13512
OCEAH DYNAMICS	OHIO
The Seasat commercial demonstration program	Wood resources and utilization patterns in the
p0115 N82-14561	North Central Region and energy needs for the
OCEAN TEMPERATURE	manufacture of wood products
Experimental demonstration of the feasibility of	[DB81-030356] p0019 N82-12604
the Mist Flow Ocean Thermal Energy Process	OIL BEPLORATION
[AIAA PAPER 81-2596] p0136 A82-18220 OCEAN THRRNAL ENERGY CONVERSION	Development of organic geochemical and isotope techniques for hydrocarbon exploration
Small-scale uses and costs of hydrogen derived	[BMFT-FB-T-80-076] p0097 N82-10482
from OTEC ammonia	Plan for technological research and development
p0084 A82-11792	related to the petroleum activities on the
Review of electrochemical energy conversion and	Norwegian Continental Shelf. 1981-1985;
storage for ocean thermal and wind energy systems	Appendixes: 1. Technical challenges. 2.
p0126 A82-11832	Research requirements. 3. High priority programs [DB81-904014] p0104 N82-11520
Proposed 12.5 NWe shelf-mounted OTEC pilot plant	[DE81-904014] p0104 N82-11520 Blogeochemical evidence for subsurface hydrocarbon
for power, water and mariculture at St. Croix [AIAA PAPER 81-2546] p0127 A82-14011	occurrence, recluse oil field, Wyoming:
Alternative ocean energy products and hybrid	Preliminary results
geothermal-OTEC /GEOTEC/ plants	[USGS-CIRC-837] p0110 N82-12693
[AIAA PAPER 81-2547] p0128 A82-14012	Offshore petroleum industry environmental data
Proposed 10 MWe OTEC pilot plant for the	requirements: Emphasis on remote sensing
Commonwealth of the Northern Mariana Islands	p0027 N82-14557 Bibliography of publications dealing with tar sands
[AIAA PAPEE 81-2561] p0128 A82-14020 Florida's proposed OTEC pilot plant for Key West	[DE81-026146] p0115 N82-14594
[AIAA PAPER 81-2563] p0003 A82-14021	Geologic applications of thermal-inertia mapping
An estimate of OTEC costs, market potential and	from satellite Powder River, Wyoming; Cubeza
proof-of-concept Vessel financing	Prieta, Arizona, and Yellowstone National Park
[AIAA PAPER 81-2567] p0003 A82-14024	[E82-10011] p0118 N82-15489
OTEC ocean system development	OIL FIELDS
[AIAA PAPES 81-2590] p0130 A82-14038	Oil and gas industry and environmental pollution: Application of systems reliability analysis for
Turboexpanders for OTEC power plants [AIAA PAPER 81-2592] p0003 A82-14040	the evaluation of the status of environmental
Experimental demonstration of the feasibility of	pollution control in the Nigerian petroleum
the Mist Flow Ocean Thermal Energy Process	industry
[AIAA PAPER 81-2596] p0136 A82-18220	p0008 N82-10583
Overview and FY 1981 progress on open-cycle OTEC	Petroleum geology and resource assessment of the
power systems	middle Caspian Basin, USSR, with special emphasis on the Uzen field
[DE81-029277] p0144 N82-15580 OCEANGGRAPHIC PARAMETERS	[DE81-029951] p0104 N82-11518
Oceans and ocean currents: Their influence on	OIL POLLUTION
climate	Pollution of the soil by aviation gasoline
[DE81-027263] p0016 N82-11731	[FML-1979-41] p0032 N82-15596
OCBAHOGRAPHY	OIL RECOVERY
Offshore petroleum industry environmental data	Tertiary oil recovery processes research at the
requirements: Emphasis on remote sensing p0027 N82-14557	University of Texas [DE81-025222] p0096 N82-10477
OFFSHORE ENERGY SOURCES	Ion exchange characteristics of enhanced oil
Waves of energy	recovery systems (miscibility studies)
p0121 A82-10450	[DE81-769734] p0096 N82-10478
Alternative ocean energy products and hybrid	Oil and gas industry and environmental pollution:
geothermal-OTEC /GEOTEC/ plants	Application of systems reliability analysis for
[AIAA PAPER 81-2547] p0128 A82-14012	the evaluation of the status of environmental pollution control in the Nigerian petroleum
Turbines in the ocean p0132 A82-16844	industry
International Symposium on Wave and Indal Energy,	p0008 N82-10583
2nd, St. John's College, Cambridge, England,	Algorithm for computing in-situ combustion oil
September 23-25, 1981, Proceedings	recovery performance
P0135 A82-18124	[DE81-030340] p0098 N82-11153
Petroleum geology and resource assessment of the	Microenulsions, enulsions and related systems:
middle Caspian Basin, USSR, with special	Energy applications p0113 N82-13545
emphasis on the Uzen field [DB81-029951] p0104 N82-11518	Field demonstration of the conventional steam
E polos dos (1010	drive process with ancillary materials
	[DE81-0268491 p0115 N82-14522

Field demonstration of the conventional steam	Model based studies of some optical and electronic
drive process with ancillary materials [DE81-026962] p0115 N82-14523	properties of narrow and wide gap materials p0062 A82-18471
Bibliography of publications dealing with tar sands	OPTICAL PUMPING
[DE81-026146] p0115 H82-14594	A solar simulator-pumped gas laser for the direct
Progress report to the Department of Energy in	conversion of solar energy
support of basic energy and policy research	p0044 A82-11710
[DE81-025882] p0028 N82-14648	Investigation of direct solar-to-microwave energy
Relational methodclogy for integrating and analyzing field test and research data	conversion techniques [NASA-CR-161883] p0067 N82-11544
describing enhanced cil recovery	OPTICAL REFLECTION
[DE81-030441] p0118 N82-15508	Geometrical optical performance studies of a
Improved polymers for enhanced oil recovery	composite parabolic trough with a fin receiver
synthesis and rheology	p0043 A82-11390
[DE81-030194] p0118 N82-15509	Solar concentrator panel and gore testing in the
Potential environmental problems of enhanced oil	JPL 25-foot space simulator
and gas recovery techniques [PB81-240186] p0034 N82-15637	[AIAA PAPER 81-2534] p0054 A82-14005 Aplanatic double reflection system for
[PB81-240186] p0034 N82-15637 OIL SLICKS	thermophotovoltaic applications - Design
Oil and gas industry and environmental pollution:	p0060 A82-17293
Application of systems reliability analysis for	OPTIMAL CONTROL
the evaluation of the status of environmental	Performance analysis and simulation of the SPS
pollution control in the Nigerian petroleum	reference phase control system
industry	p0071 N82-12544
p0008 N82-10583	Project impact analysis as an optimal control problem irrigation and hydroelectric power
Oil spill identification by chemical analysis p0115 N82-14583	project
OPEN CIRCUIT VOLTAGE	[DE81-028465] p0021 N82-12842
Numerical simulation of solar cell open circuit	OPTIMIZATION
voltage decay	Antenna optimization and cost consideration for
p0041 A82-10658	the Solar Power Satellite microwave system
Investigations of the OCVD transients in solar cells	p0145 A82-11744
Open Circuit Voltage Decay	Solar data base management system [DE81-023122] p0066 N82-10952
Multijunction high voltage concentrator solar cells	An optimization model for energy generation and
p0047 182-11796	distribution in a dynamic facility
Current-voltage characteristics of	p0011 N82-11310
semiconductor-electrolyte junction solar cells	Modeling energy-conservation potentials of
p0055 A82-15112	community energy-system technologies
Theory of back surface field silicon solar cells p0056 A82-15447	[DE81-026059] p0013 N82-11589 OPTIONS
Influence of the junction area to edge area ratio	Evaluating R and D options under uncertainty.
on the open-circuit voltage of silicon solar cells	Volume 3: An electric-utility
p0058 A82-16133	generation-expansion planning model
p0058 A82-16133 Effects of double-exponential current-voltage	generation-expansion planning model [DE81-904237] p0035 N82-16013
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRANSFORMATIONS
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials P0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes P0127 A82-12938
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials P0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes P0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries P0155 A82-15727 ORGANIC WASTES (PURL CONVERSION) Methane production from alkaline food waste P0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] p0026 N82-13984	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (FURL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819]
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] p0026 N82-13984	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] p0135 A82-17913	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASUREMENT OPTICAL MEASUREMENT OPTICAL MEASUREMENT INSTRUMENTS	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASUREMENT OPTICAL MEASUREMENTS An integrating sphere based on absolute method for	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PURL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] Interactive model to assess economics of anaerobic
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Hethane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm
P0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system P0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine P0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] DPTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Hethane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASUREMENT An integrating sphere based on absolute method for measuring solar absorptance p0058 A82-16247 Soot formation in synfuels	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (FURL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed conhustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Waste-to-energy Systems Institutional Barriers
p0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] DOTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance p0058 A82-16247 Soot formation in synfuels [DE81-030273] OPTICAL PROPERTIES The optical properties-microstructure relationship	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-00098] p0019 N82-12621
P0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system P0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine P0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPES 82-0377] OPTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Soot formation in synfuels [DE81-030273] OPTICAL PROPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PURL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-00098] Costs for alternative grain-residue-collection systems
P0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system P0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine P0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance P0058 A92-16247 Soot formation in synfuels [DE81-030273] OPTICAL PEOPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Hethane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-00098] p0019 N82-12621 Costs for alternative grain-residue-collection systems [DE81-029072] p0110 N82-12633
P0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system P0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine LOW-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MRASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MRASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Soot formation in synfuels [DE81-030273] OPTICAL PEUPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers P0037 A82-10011	generation-expansion planning model [DE81-904237] p0035 N82-16013 OBDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Waste-to-energy Systems Institutional Barriers Assessment Norkshop [DE82-00098] p0019 N82-12621 Costs for alternative grain-residue-collection systems [DE81-029072] p0110 N82-12633 Development of testing procedures and
P0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system P0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine P0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance P0058 A92-16247 Soot formation in synfuels [DE81-030273] OPTICAL PEOPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Hethane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-00098] p0019 N82-12621 Costs for alternative grain-residue-collection systems [DE81-029072] p0110 N82-12633
Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance p0058 A92-16247 Soot formation in synfuels [DE81-030273] OPTICAL PROPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers p0037 A82-10011 Optical properties of selectively absorbing chromum films deposited at oblique angle of incidence	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRAMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (PUBL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] p0019 N82-12621 Costs for alternative grain-residue-collection systems [DE81-029072] p0110 N82-12633 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic fuels production
P0058 A82-16133 Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system P0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine P0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEABCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MRASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPES 82-0377] OPTICAL MRASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Soot formation in synfuels [DE81-030273] OPTICAL PROPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers P0037 A82-10011 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence P0040 A82-10467	generation-expansion planning model [DEB1-904237] p0035 N82-16013 ORDRE-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials P0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes P0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries P0155 A82-15727 ORGANIC WASTES (FURL CONVERSION) Methane production from alkaline food waste P0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DEB1-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-00098] p0019 N82-12621 Costs for alternative grain-residue-collection systems [DE81-029072] p0110 N82-12633 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic fuels production [DE81-030822] p0020 N82-12661
Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system P0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine LOW-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] P0112 N82-13248 OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233884] P0026 N82-13984 OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] P0135 A82-17913 OPTICAL MEASUREMENTS An integrating sphere based on absolute method for measuring solar absorptance Soot formation in synfuels [DE81-030273] P0099 N82-11164 OPTICAL PROPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers P0037 A82-10011 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence P0040 A82-10467 Geometrical optical performance studies of a	generation-expansion planning model [DEB1-904237] p0035 N82-16013 ORDRE-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (FURL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-00098] Costs for alternative grain-residue-collection systems [DE81-029072] Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic fuels production [DE81-030822] Blomass energy systems: Descriptions and
Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system P0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE61-029482] p0112 N82-13248 OPERATIONS RESEABCH Measures of effectiveness of transportation systems management [PB81-233684] p0026 N82-13984 OPTICAL MEASURMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] p0135 A82-17913 OPTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance Soot formation in synfuels [DE81-030273] p0099 N82-11164 OPTICAL PROPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers OPTICAL properties of selectively absorbing chromium films deposited at oblique angle of incidence P0040 A82-10467 Geometrical optical performance studies of a composite parabolic trough with a fin receiver	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials P0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes P0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries P0155 A82-15727 ORGANIC WASTES (FURL CONVERSION) Methane production from alkaline food waste P0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] p0019 N82-12621 Costs for alternative grain-residue-collection systems [DE81-029072] p0110 N82-12633 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic fuels production [DE81-030822] Biomass energy systems: Descriptions and employment requirements for typical operations
Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A82-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system P0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine P0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEARCH Measures of effectiveness of transportation systems management [PB81-233684] OPTICAL MEASUREMENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASUREMENT An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Soot formation in synfuels [DE81-030273] OPTICAL PROPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers P0037 A82-10011 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence P0040 A82-10467 Geometrical optical performance studies of a composite parabolic trough with a fin receiver p0043 A82-11390	generation-expansion planning model [DEB1-904237] p0035 N82-16013 ORDRE-DISORDER TRANSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (FURL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-00098] Costs for alternative grain-residue-collection systems [DE81-029072] Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic fuels production [DE81-030822] Blomass energy systems: Descriptions and
Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A62-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system p0133 A82-17633 OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine p0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS RESEABCH Heasures of effectiveness of transportation systems management [PB81-233884] OPTICAL HEASUREMENT Optical diagnostic techniques for coal-fired HBD applications [AIAA PAPES 82-0377] OPTICAL MEASUREMENTS An integrating sphere based on absolute method for measuring solar absorptance p0058 A82-16247 Soot formation in synfuels [DE81-030273] OPTICAL PROPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers p0037 A82-10011 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-10467 Geometrical optical performance studies of a composite parabolic trough with a fin receiver p0043 A82-11390 Analysis of the optical characteristics of solar collectors	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRMSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTES (FUEL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] p0095 N82-10267 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE81-020098] p0019 N82-12621 Costs for alternative grain-residue-collection systems [DE81-029072] p0110 N82-12633 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic fuels production [DE81-030822] p0020 N82-12661 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] ORTHOTROPIC PLATES Application of orthotropic plate theory to
Effects of double-exponential current-voltage characteristics on the performance of solar cells p0058 A62-16472 OPERATIONAL HAZARDS Operations of small wind turbines on a distribution system OPERATIONAL PROBLEMS Experiences with a Grumman windstream 25 horizontal axis wind turbine D0134 A82-17638 Low-Btu gasification of coal for electric power generation, phase 1, 2, and 3 [DE81-029482] OPERATIONS ERSBARCH Measures of effectiveness of transportation systems management [PB81-233884] OPTICAL MEASURINGENT Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] OPTICAL MEASURING INSTRUMENTS An integrating sphere based on absolute method for measuring solar absorptance p0058 A82-16247 Soot formation in synfuels [DE81-030273] OPTICAL PROPERTIES The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers p0037 A82-10011 Optical properties of selectively absorbing chromium films deposited at oblique angle of incidence p0040 A82-10467 Geometrical optical performance studies of a composite parabolic trough with a fin receiver p0043 A82-11390 Analysis of the optical characteristics of solar	generation-expansion planning model [DE81-904237] p0035 N82-16013 ORDER-DISORDER TRHSFORMATIONS Introduction to the role of crystal defects in solar materials p0037 A82-10009 ORGANIC COMPOUNDS Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 ORGANIC WASTRS (FURL CONVERSION) Methane production from alkaline food waste p0092 N82-10115 Enhancement of methane gas production using an industrial waste in anaerobic digestion effects of chrome shavings from leather tanning [DE81-023819] Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-00098] [DE82-00098] [DE81-029072] Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic fuels production [DE81-030822] Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] ORTHOTROPIC PLARES

SUBJECT 1EDEX PARABOLOID MIRRORS

OSCILLATING FLOW : Experimental and analytical investig	gation of a	Field nonuniformity due to photogene in a p-i-n solar cell	
fluidic power generator [JPL-PUB-81-100]	p0142 N82-13386	P-N JUNCTIONS	p0060 A82-17650
OTTO CYCLE Electric and hybrid vehicle environs	-	Laser bonded n-Gals/p-GaSb heterojus intercell Ohmic contact	nction
subsystem study [NASA-CH-164996] .	p0020 N82-12658	Effect of junction depth on the per	p0041 A82-10776 formance of a
OUTGASSING Outgassing of two synthetic fuels		diffused n/+/p silicon solar cell	p0056 A82-15444
[AD-A104580] OVERPRESSURE	p0100 N82-11231	n-/indium tin oxide//p-InP solar cel	lls p0058 A82~16471
Soviet UCG experience specifically r field experiments in the United St		Electrical properties of infrared pl Cd/x/Hg/1-x/Te detectors	notovoltaic
[DE81-028642] - OVERVOLTAGE	p0111 N82-13244	PACIPIC BORTHWEST (US)	p0136 A82-18466
Distributed photovoltaic systems: U interface issues and their present		Chemical and geochemical studies of: Washington	f the coast of
[NASA-CR-165019] .	p0076 N82-13492	[DE81-030319] Wind Power: Research on network win	p0017 N82-12513 nd power over
Peat biogasification development pro [DE81-028299]		the Pacific northwest. Executive	
Vapor-phase cracking and wet oxidati	p0101 N82-11243 ion as	[DE81-029360] PAHELS	p0142 N82-13519
potential pollutant control techniquesification	ques for coal	Solar concentrator panel and gore to	esting in the
[PB81-219594]	p0015 N82-11661	JPL 25-foot space simulator [AIAA PAPER 81-2534]	p0054 A82-14005
Oxydesulfurization of coal by acidic solutions	: iron sulfate	PARABOLIC BODIES Frequency response analysis of fluid	l control
[DE82-000464] Kinetics of wet oxidation of biologi	p0106 N82-12199	systems for parabolic-trough solar	collectors p0064 N82-10513
from coal-conversion wastewater tr	eatment	PARABOLIC REFLECTORS	- -
[DE82-000525] Investigation of the in-situ oxidati	p0021 N82-12674 ion of methanol	AAI Corporation receiver design expectating solar collectors	erience in
in fuel cells		[ASME PAPER 81-SOL-1]	p0041 A82-10969
Photoelectrochemical sclar cells: S	p0143 N82-14642 Stabilization	Design and testing of a uniformly in nontracking concentrator	Liuminating
of small-band-gap semiconductor in solution by surface-attached organ		Pocal plane flux distributions produ	p0042 A82-11209 uced by solar
polymer	_	concentrating reflectors	
[DE81-030312] Kinetics of reactions in a wet flue	p0081 M82-15569 gas	Geometrical optical performance stud	p0043 A82-11211 lies of a
simultaneous desulfurization and d system	lenitrification	composite parabolic trough with a	fin receiver p0043 A82-11390
[DE81-029853] OXIDATION RESISTANCE	p0033 N82-15607	Ground-mounted thermal storage for to dish solar collector/Stirling engi	
Oxidation of electrodeposited black selective solar absorber films	Chrome	Secondary concentrators for parabol:	p0047 A82-11781 c dish solar
OXIDATION-REDUCTION REACTIONS	p0060 A82-17255	thermal power systems	
Solar chemistry of metal complexes -	hydrogen	The effect of concentrator field lay	p0048 A82-11798 yout on the
production	p0058 A82-16124	EE-1 small community solar power s	system p0048 A82-11799
Treatment of biomass-gasification wa		Development of a solar receiver for	
wet-air oxidation [DE82-000935]	p0025 N82-13567	Rankine cycle engine	p0048 A82-11800
OXIDE FILES The contoured-oxide monolithic serie		Control system development for a 1 ! thermal power plant	W/e/ solar
battery	_		p0048 A82-11801
V205-Si photovoltaic cells	p0042 A82-11190	Status and technology development	
Oxide optimization at the p-Si/aqueo	p0051 A82-12824 pus electrolyte	[AIAA PAPER 81-2530] Development, solar test, and evaluate	p0053 A82-14001
interface	-	high-temperature air receiver for	
Oxidation of electrodeposited black	p0052 A82-13199 chrome	parabolic dish applications [AIAA PAPER 81-2532]	p0053 A82~14003
selective solar absorber films	D0060 392-17266	Solar energy system design: A simple sizing the collector field and the	
OXYGEN	P0060 A82-17255	[DE81-028852]	p0065 N82~10541
MHD oxidant intermediate temperature heater study	ceramic	Design, cost and performance compar- several solar thermal systems for	
[NASA-CR-165453]	p0144 N82-15527	Volume 1: Executive summary	
OXYGEN PRODUCTION Solar hydrogen system design conside	rations	[DE81-029881] Near-term improvements in parabolic	p0069 N82-11576
	p0084 A82-11788	economic and performance assessmen	it
Load-change testing of a large comme plant	ectal oxygen	[DE82-001158] PARABOLOID MIRRORS	p0073 N82~12615
[EPRI-NP-1824]	p0096 N82-10275	Experimental investigation of parabo solar concentration with tubular h	
P			p0040 A82-10389
P-I-H JUNCTIONS		Nonimaging concentrators for photovo in space	offer arrays
Stability of n-i-p amorphous silicon			p0046 A82-11761
A comparison of p-i-n and Schottky b	p0043 A82-11343 parrier	Theoretical analysis of the performa gravity-controlled solar concentra	
hydrogenated amorphous silicon, a- cells	Si:H, solar		p0050 A82-12812
40220	p0060 A82-17649	Use of ceramics in point-focus solar [AIAA PAPER 81-2552]	p0054 A82-14015

Thermal deformation of concentrators in an antisymmetric temperature field	Methodology for the evaluation of aerodynamic performance and rotor optimization under
p0062 A82-18698	constant RFMoperation
PARAMETER IDENTIFICATION Analysis of power, mass, and size parameters of	[AIAA PAPER 81-2560] p0128 A82-14019 Up- and down-wind rotor half interference model
solar vapor-turbine two-circuit systems with	for VAWT Vertical Axis Wind Turbines
organic working bodies	[AIAA PAPER 81-2579] p0129 A82-14031
p0044 A82-11421 The universal plane method for calculating the	An analytical model for high-low-emitter /BLE/ solar cells in concentrated sunlight
dimensions of heliostats	p0055 A82-15441
p0062 A82-18697	
PARAMETERIZATION Parametric sensitivity study for solar-assisted	induction generator p0131 A82-15650
heat-pump systems	OESYS: A simulation tool for nonconventional
[DE81-030309] p0067 N82-11407	energy applications analysis. Theoretical and
PARTICLE PRECIPITATION The effect of soiling on sclar mirrors and	operational description with user documentation [DE81-029701] p0007 H82-10514
techniques used to maintain high reflectivity	Tennessee Valley Authority atmospheric
p0037 A82-10013	fluidized-bed combustor simulation
PARTICLE SIZE DISTRIBUTION Pulverized-fuel combustion: Modeling and scaleup	[DE81-030262] p0098 N82-11151 Algorithm for computing in-situ combustion oil
methodologies	recovery performance
[DE81-026546] p0093 N82-10158	[DE81-030340] p0098 N82-11153
Pulverized-coal firing of aluminum melting furnaces [DOB/CS-40037/T2] p0095 N82-10262	The effects of impurities on the performance of silicon solar cells
Catalytic effect of iron in hydrogasification of	[NASA-CR-164945] p0067 N82-11548
coal	Jet impingement heat transfer enhancement for the
[DE81-023928] p0113 N82-14323 PARTICLES	GFU-3 Stirling engine [NASA-TM-82727] p0140 N82-11993
Separation of particles from coal derived liquids	Optimization of solar heating and cooling systems
via surface charge properties	[NP-1903997] p0072 N82-12599
[DE81-029088] p0092 M82-10141 Study of the formation of submicron particulates	Comparative economic performance of selected passive solar heating and cooling technologies
generated by coal combustion	[DE81-030220] p0072 N82-12600
[DE81-027447] p0008 N82-10586	Seasonal performance factors for active solar
Control of utility boiler and gas turbine pollutant emissions by combustion modification,	systems and heat-pump systems [DE81-028569] p0074 N82-12625
phase 2	Application of a gravity-driven wickless heat pipe
[PB81-222267] p0015 N82-11654	for ice production in a cold energy storage system
Real-time coarse-particle mass measurements in a high-temperature/pressure coal-gasifier process	p0159 N82-13377 Performance predictions of passive solar
treatment	connercial buildings
[DE81-030039] p0119 M82-15604	[DE81-027979] p0079 N82-15247
Real time coarse particle mass measurements in a high temperature and pressure coal gasifier	PERFORMANCE TESTS Modeling and testing a salt gradient solar pond in
process treatment	northeast Ohio
[DE81-030036] p0033 N82-15609	p0043 A82-11210
PARTICULATE SAMPLING Informational report on the measurement and	Performance analysis of d.cmotor-photovoltaic converter system. II - Series and shunt excited
characterization of diesel exhaust emissions	notors
[PB81-221251] p0009 H82-11175	p0043 A82-11213
Carcinogenic effects of ccal-conversion materials [DE81-028108] p0029 N82-14803	An experimental study of SO3 dissociation as a mechanism for converting and transporting solar
PAVEMENTS	energy
Construction of a recycled Fortland cement	p0043 A82-11214
concrete pavement Connecticut expressway [PB81-233553] p0023 N82-13267	Development of space reactor core heat pipes p0122 A82-11747
PEAT	Engineering development testing of the GPHS-RTG
An overview of peat gasification	converter General Purpose Heat
p0089 A82-11848 Peat biogasification development program	Source-Radioisotope Thermoelectric Generator for Galileo orbiter power supply
[DE81-028299] p0101 982-11243	p0122 A82-11752
Peat resource evaluation: State of Maine	Development free-piston Stirling test-bed engine
[DE82-000227] p0109 N82-12523 Peat deposits of Dismal Swamp pocosins: Camden,	p0123 182-11808 The effect of shielding on the aerodynamic
Currituck, Gates, Pasquotank, and Perquinans	performance of Savonius wind turbines
Counties, North Carolina	p0125 A82-11826
[DE81-029642] p0109 N82-12524 Development of peatlands in northern Minnesota	Performance testing of a Savonius windmill rotor in shear flows
[DE82-000873] p0112 N82-13475	p0125 A82-11827
PRRPORMANCE PREDICTION	Progress in large area photovoltaic devices based
Modeling and testing a salt gradient solar pond in northeast Ohio	on amorphous silicon alloys p0049 A82-11855
p0043 A82-11210	Variable speed wind turbine control system
Cost and performance projections for SPS	p0127 A82-11859
photovoltaic blankets p0045 A82-11741	Investigation of the performance of an MoS2/I-/I2/C electrochemical solar cell
Heat pipes for NEP spacecraft radiators	p0053 A82-13805
p0122 A82-11748	Development, solar test, and evaluation of a
Overview of DOB's large stationary Stirling engine development program	high-temperature air receiver for point-focusing parabolic dish applications
p0123 A82-11805	[AIAA PAPER 81-2532] p0053 A82-14003
Theoretical analysis of the performance of a	Wind turbine assisted diesel generator systems [AIAA PAPER 81-2559] p0128 A82-14018
gravity-controlled sclar concentrator p0050 A82-12812	Alcoa vertical axis wind turbines
A method for preliminary evaluation and sizing of	p0133 A82-17628
solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014	Development of high-performance, high-reliabulity windpower generators
[TTDD EDETH 0.1 500.1] 60004 E050 [40.14	p0134 A82-17640

PHOSPHORIC ACID FUEL CELLS

The electric utility 4.5 NW fuel cell power plant Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 - An urban demonstration p0131 A82-15070 Pirst results from the UMass wind tunnel test program --- for windpowered generator optimization Fundamental investigations on fuel cells for p0134 A82-17643 transportation applications Performance testing and rating standards for Wind Energy Conversion Systems p0137 N82-10493 Design considerations for vehicular fuel cell power plants [DE81-769737] p0135 A82-17646 The El Paso electric 20-kilowatt photovoltaic system
[AIAA PAPER 82-0064] p0060 A82-17761 p0138 N82-10961 PHOTOACOUSTIC SPECTROSCOPY The Lea county electric lou-minous.

grid-connected photovoltaic system
[AIAA PAPER 82-0067] p0061 A82-17764
Performance of a small low speed Darrieus type rotor
p0136 A82-18328 Photoacoustic figure of merit for photothermal energy conversion efficiency p0121 A82-10192 PHOTOCHEMICAL REACTIONS Solar chemistry of metal complexes --- hydrogen Performance evaluation of the solar kinetics T-700 production p0058 A82-16124 Rate coefficients of combustion/fuel conversion line concentrating solar collector p0063 N82-10502 [NASA-CR-161856] Performance testing of the TOLTEC TI-410 concentrating solar collector reactions by high-temperature photochemistry [DE81-027965] p0023 N82-13192 [DE81-029994] PHOTOCORDUCTIVITY p0071 N82-11617 Evaluation of the micro-carburetor A comparison of p-1-n and Schottky barrier [NASA-CR-164958] p0016 N82-11994 hydrogenated amorphous silicon, a-Si:H, solar Rectenna array measurement results cells n0149 N82-12564 n0060 A82-17649 PHOTODECOMPOSITION Performance analysis of 11 Denver Metro passive Photocorrosion of strontium titanate photoanodes [DB81-025473] p0074 N82-12626 p0057 A82-16056 Passive/hybrid solar components: An approach to PHOTOBLECTRIC CELLS Some characteristics of silicon photocells standard thermal test methods fabricated by planar technology n0077 N82-13549 p0039 A82-10386 PERIODIC VARIATIONS Network wind power over the Pacific northwest. Electrical characteristics of high-voltage Appendix 1: Wind statistics summaries for the wind power data stations
[DE81-029291] p0112 N82-13 germanium photoconverters under high illumination intensities p0040 A82-10391 p0112 N82-13518 Investigation of the possibility of using inexpensive concentrating systems in the modules PERMEABILITY Pormation evaluation in liquid-dominated geothermal reservoirs of a photoelectric station [DOE/ET-28384/T1] p0052 A82-13713 p0109 N82-12514 Production and certain properties of photoelectric PETROLEUM PRODUCTS Energy expenditure and dietary change
[PB81-218471] p0009 N82-19
Models for forecasting energy use in the US farm cells based on silicon epitaxial structures p0009 N82-10717 p0053 A82-13716 Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells sector [DE81-904220] p0018 N82-12580 [DE81-027254] p0068 N82-11558 PHASE CHANGE MATERIALS PHOTOELECTRIC EMISSION A practical method of analysis of the Performance of a cylindrical phase change thermal energy storage unit
[AIAA PAPER 82-0076] current-voltage characteristics of solar cells p0051 A82-12823 p0155 A82-17770 PHASE CONTROL PHOTOELECTRIC GENERATORS Performance analysis and simulation of the SPS Electrical characteristics of high-voltage reference phase control system germanium photoconverters under high p0071 N82-12544 illumination intensities p0040 A82-10391 Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 PHOTOBLECTRICITY Solar photovoltaic system engineering perspectives [DE81-023179] p0066 N82-105 Coherent multiple tone technique for ground based p0066 N82-10570 PHOTOBLECTROCHEMICAL DEVICES SPS phase control p0147 N82-12546 Photoelectrochemical behaviour of CdS/NaI.3.3NH3 /liquid sodium iodide ammoniate/ junctions -Utilization in solar energy conversion An interferometer-based phase control system p0147 N82-12547 p0051 A82-12822 A sonic satellite power system microwave power transmission simulator Investigation of the performance of an p0147 N82-12548 MoS2/I-/I2/C electrochemical solar cell p0053 A82-13805 SPS phase control studies p0147 N82-12549 Sputtered than film electrodes for SPS fiber optic link assessment photoelectrochemical cells p0147 N82-12550 p0055 A82-15111 PHASE TRANSPORMATIONS Current-voltage characteristics of Performance of a cylindrical phase change thermal semiconductor-electrolyte junction solar cells energy storage unit [AIAA PAPER 82-0076] p0055 A82-15112 Photoelectrochemical cells using polycrystalline and thin film MoS2 electrodes p0155 A82-17770 Tertiary oil recovery processes research at the University of Texas [DE81-025222] p0057 A82-16053 The use of semiconducting oxide ceramics in solar p0096 N82-10477 Liquid natural gas rapid thase transitions energy conversion P0118 N82-15232 p0059 A82-17099 [PB81-244774] Photoelectrochemical solar cells: Stabilization PHRNOLS of small-band-gap semiconductor in aqueous solution by surface-attached organic conducting Thermolysis of naphthols [DE81-029684] p0116 N82-15152 PHILOSOPHY polymer The nuclear controversy: Unequal competition in [DE81-030312] p0081 N82-15569 public policy-making [ERG-035] PHOTOELECTROCHEMISTRY Photoanode on the base of pheophytin-sensitized D0027 N82-14626 PHOSPHINES reactions Impurity effects in a-Si:H solar cells [DE81-025069] p p0059 A82-16742 p0069 N82-11575

PHOTOIOBIZATION SUBject index

PHOTOIONIZATION	Soiar cell development for the Power Extension
Infrared quenching of photocapacitance in	Package
Cu/x/S/CdS solar cells	p0046 A82-11763
p0042 A82-11187 Photoanode on the base of pheophytin-sensitized	NASA preprototype redox storage system for a photovoltaic stand-alone application
reactions p0059 A82-16742	p0153 A82-11774 Photovoltaic system studies and developments p0049 A82-11804
PHOTOLYSIS Rate coefficients of combustion/fuel conversion	Progress in large area photovoltaic devices based
reactions by high-temperature photochemistry [DE81-027965] p0023 N82-13192	on amorphous silicon alloys p0049 A82-11855
PHOTOOXIDATION Photoanode on the base of pheophytin-sensitized	Photovoltaics, the solar electric solution p0050 A82-12532
reactions	V205-Si photovoltaic cells
p0059 A82-16742	p0051 A82-12824
PHOTOSYNTHESIS Response of the oceans to increasing atmospheric	Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667
carbon dioxide [DE81-028178] p0025 N82-13558	Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and
Progress report to the Department of Energy in support of basic energy and policy research	application to concentrating collectors French thesis
[DE81-025882] p0028 N82-14648	p0055 A82-15006
PHOTOTHERMAL CONVERSION	Investigations on a Se-CdO photovoltaic cell
The optical properties-microstructure relationship in particulate media - Optical tailoring of solar absorbers	p0132 A82-16052 Low cost silicon-on-ceramic photovoltaic solar cells p0059 A82-17098
p0037 A82-10011	The El Paso electric 20-kilowatt photovoltaic system
The application of reversible chemical reactions to solar thermal energy systems	[AIAA PAPER 82-0064] p0060 A82-17761 The Mt. Laguna photovoltaic project
p0038 A82-10020	[AIAA PAPER 82-0065] p0061 A82-17762
Materials science issues encountered during the	A photovoltaic system with energy storage -
<pre>development of thermochemical concepts in screening of reactions for solar energy</pre>	Natural Bridges National Monument 100-kW system [AIAA PAPER 82-0066] p0155 A82-17763
applications	The Lea county electric 100-kilowatt
p0038 A82-10021	grid-connected photovoltaic system
Photoacoustic figure of merit for photothermal	[AIAA PAPER 82-0067] p0061 A82-17764
energy conversion efficiency	Performance of terrestrial photovoltaic modules at
p0121 A82-10192 Optical properties of selectively absorbing	MIT Lincoln Laboratory experimental photovoltaic systems
chromium films deposited at oblique angle of	[DE81+029995] p0064 N82-10519
incidence	Intermediate photovoltaic-system application
p0040 A82-10467	experiment operational performance report.
Spectrally selective copper sulphide coatings p0040 A82-10468	Volume 1: For Lovington Square Shopping Center
Development of a solar thermal central heat	site, Lovington, New Mexico [DE81-028971] p0065 N82-10543
receiver using molten salt	Electrochemical photovoltaic cells
[ASHE PAPER 81-SCL-2] p0041 A82-10970	[DE81-769704] p0066 N82-10568
Conceptual design of an advanced water/steam	Mississippi County Community College solar
receiver for a solar thermal central power system [ASME PAPER 81-SCL-5] p0042 A82-10973	photovoltaic project [DE81-030669] p0068 N82-11554
An evaluation of alternate system configurations	Zn3P2 as an improved semiconductor for
for solar repowering electric power plants	photovoltaic solar cells
p0048 A82-11803	[DE81-025587] p0069 N82-11577
High-temperature solar central receivers p0052 A82-12949	Carlisle house: An all-solar electric residence [DOE/ET-20279/133] p0071 N82-11622
Nickel sulphide-lead sulphide and nickel	Intermediate photovoltaic system application
sulphide-cadmium sulphide selective coatings for	experiment operational performance: Executive
solar thermal conversion p0059 A82-16745	summary. Volume 1: For Newman Power Station,
Electric utility modeling extensions to evaluate	El Paso, Texas [DE81-031934] p0072 N82-12602
solar plants	Photovoltaic market analysis program: Background,
p0061 A82-18025	model development, applications and extensions
A simplified model of the thermohydraulic behaviour of a linear collector network for the	[DE81-029711] p0073 N82-12609
conversion of the solar energy	Cost goals for a residential photovoltaic/thermal liguid collector system set in three northern
p0062 A82-18816	locations
PHOTOVOLTAIC CELLS	[DE81-029700] p0073 N82-12610
Introduction to photovoltaics - Physics, materials and technology	Space applicable DOE photovoltaic technology: An update
p0038 A82-10022 Research and device problems in photovoltaics	[NASA-CR-165021] p0076 N82-13491 Distributed photovoltaic systems: Utility
p0039 A82-10023	interface issues and their present status
AAI Corporation receiver design experience in concentrating solar collectors	[NASA-CR-165019] p0076 N82-13492
[ASME PAPER 81-SCL-1] p0041 A82-10969	A Module Experimental Process System Development Unit (MEPSDU)
Design and testing of a uniformly illuminating	[NASA-CR-165014] p0076 N82-13496
nontracking concentrator	Intermediate photovoltaic system application
p0042 A82-11209	experiment operational performance report.
Performance analysis of d.cmotor-photovoltaic converter system. II - Series and shunt excited	Volume 2 for Beverly High School, Beverly, Mass. [DB82-000811] p0077 N82-13532
motors	Photovoltaic systems performance experience
p0043 A82-11213	[DE81-025725] p0079 N82-14656
Cost and performance projections for SPS	Solar Photovoltaic Residential Project. Project
photovoltaic blankets p0045 A82-11741	Integration Meeting, Agenda and Abstracts
Nonimaging concentrators for photovoltaic arrays	[DE81-028433] p0079 N82-14657 Solar power systems smaller than 500 W for
in space	military use
p0046 A82-11761	[FML-1980-06] p0080 N82-15534

PHOTOVOLTAIC CONVERSION	Photovoltaic mechanisms in polycrystalline thin
Introduction to basic aspects of plasma-deposited	film silicon solar cells
amorphous semiconductor alloys in photovoltaic conversion	[DE81-030370] p0072 N82-12608 Basis for research proposals concerning
p0039 A82-10026 Present state of research on selective coatings	derived from biological principles
for solar-energy converters p0039 A82-10387	p0075 N82-12640 Data report for the northeast residential
A spacecraft thermophotovoltaic power source with thermal storage	experiment station, June 1981 photovoltaic systems
p0044 A82-11711	
Thin ceils - Their present status and future areas of development	Market assessment of photovoltaic power systems for agricultural applications in Morocco
p0046 A82-11764 Power management of multi-hundred kilowatt spacecraft power systems	[NASA-CR-165477] p0077 N82-14627 Study of multi-megawatt technology needs for photovoltaic space power systems. Volume 1:
p0046 A82-11769 Advances in photovoltaics R&D - An overview	
p0047 A82-11793 The development of high efficiency cascade solar	
cells - An overview p0047 A82-11794	[NASA-CR-165323-VOL-2] p0078 N82-14637
Research activities of sclar cells in ROC p0047 A82-11795	[DE81-025725] p0079 N82-14656
'Thin foll cells - A challenge for space array designers'	Testing and evaluation of a solar photovoltaic flywheel energy storage system
p0049 A82-11842 Semiconductor converters/inverters for	
photovoltaic power supply	[DE81-023179] p0066 N82-10570
p0126 A82-11857 A thermoelectric refrigerator powered by	National photovoltaic program in amorphous materials [DE81-025906] p0070 N82-11609
photovoltaic solar collectors	Solar Photovoltaic Residential Project. Project
p0049 A82-11858 Luminescent solar concentrators. II - Experimental	Integration Meeting, Agenda and Abstracts [DE81-028433] p0079 N82-14657
and theoretical analysis of their possible efficiencies	Supplement to energy for rural development:
p0052 A82-13285	Renewable resources and alternative technologies for developing countries
A study of the purification process during the	[PB81-231011] p0032 N82-15592
elaboration by electron bcmbardment of polysilicon ribbons designed for photovoltaic	PHTHALOCYANIN Low frequency capacitance characterizations on
conversion	indium/x-phase of metal free phthalocyanine
p0057 A82-16054 Influence of the junction area to edge area ratio	p0053 A82-13806
on the open-circuit voltage of silicon solar cells	
p0058 A82-16133 Aplanatic double reflection system for	[PB81-235053] p0161 N82-15436
thermophotovoltaic applications - Design p0060 A82-17293	PILOT PLANTS Proposed 12.5 NWe shelf-mounted OTEC pilot plant
Startup experience with a concentrating photovoltaic power system	for power, water and mariculture at St. Croix [AIAA PAPER 81-2546] p0127 A82-14011
[AIAA PAPER 82-0068] p0061 A82-17765 Status of the microwave power transmission	
components for the solar power satellite	Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020
Blectric utility modeling extensions to evaluate	[AIAA PAPER 81-2563] p0003 A82-14021
solar plants p0061 A82-18025	
Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors	[DE81-903763] p0137 N82-10524 Advanced system experimental facility: Solid
p0136 A82-18466	waste to methane gas. Background and process description
Market assessment of photovoltaic power systems for agricultural applications in Mexico	[DE81-030198] p0101 N82-11244
[NASA-CR-165441] p0007 N82-10506	Solvent-Refined Coal-1 Demonstration Project.
OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and	Final environmental impact statement, Volume 1 of 2 coal liquefaction plant at Newman,
operational description with user documentation	Kentucky
[DE81-029701] p0007 N82-10514 Technical and economic assessment of solar	[DE81-025983] p0010 N82-11252 Surface coal gasification
thermophotovoltaic conversion	[DE81-030183] p0102 N82-11253
[DE81-803762] p0064 N82-10515 Investigation of photovoltaic mechanisms in	Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment
polycrystalline thin-film solar cells [DE81-027272] p0065 N82-10539	report section 13(b)
Study of photovoltaic cost elements. Volume 1:	Coal liquefaction demonstration plant near
Executive report. Vclume 2: Project background [DE81-030982] p0069 M82-11566	Morgantown, West Virginia: Water assessment report
Study of photovoltaic cost elements. Volume 3:	[FB81-216103] p0011 N82-11270
Sandia National Laboratories photovoltaic systems design catalog	Industrial application of fluidized-bed combustion [DE81-030272] p0105 N82-12182
[DE81-030986] p0069 N82-11567	Solvent-Refined Coal (SRC) process
Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV	[DE81-031937] p0106 N82-12197 Fixed-bed gasification
systems: Users manual	[DE82-000432] p0108 N82-12261
Study of photovoltaic cost elements. Volume 5:	Controlled-flash pyrolysis [DE82-000284] p0111 N82-13196
Installation cost model for intermediate PV systems: Users manual	Low-Btu gasification of coal for electric power
[DE81-030981] p0069 N82-11569	generation, phase 1, 2, and 3 [DE81-029482] p0112 N82-13248

Pailure modes and effects analysis of a	Magnetohydrodynamics (MHD) Engineering Test
	Facility (ETF) 200 NWe power plant. Design
coal-slurry preheater	Requirements Document (DED)
[DE81-030425] p0117 N82-15221	[NASA-TM-82705] p0140 N82-12446
Coal and limestone feed testing for atmospheric	
fluidized bed combustion	Magnetohydrodynamics (MHD) Engineering Test
[DE81-030629] p0117 N82-15222	Facility (ETF) 200 MWe power plant. Conceptual
Gas cooled sclar power plant for generating	Design Engineering Report (CDER). Volume 1:
electrical energy in the 20MWe operating range	Executive summary
(GAST): Preliminary design phase	[NASA-CR-165452-VOL-1] p0140 N82-12570
[BMFT-FB-T-81-097] p0080 N82-15530	Investigation and research of specific
Moorhead district heating, phase 2 .	combustion-turbine and combined-cycle field
[DE81-029689] p0031 N82-15556	problems
Parallel evaluation of air-and oxygen-activated	[DE81-904231] p0141 N82-12592
sludge	Low/medium Btu coal gasification assessment
[PB81-246712] p0034 N82-15633	program for potential users in New Jersey:
PINHOLES	Executive summary .
A pinhole model for metal-insulator-semiconductor	[DE81-025475] p0111 N82-13247
solar cells	Low-Btu gasification of coal for electric power
p0056 A82-15442	generation, phase 1, 2, and 3
PIPE PLOE	[DE81-029482] p0112 N82-13248
Controlled Retracting Injection Point (CRIP)	Residual-energy-application program: EAST
system: A modified-stream method for in situ	facility requirements document, volume 1
coal gasification	[DE81-027536] p0142 N82-13526
[DE81-026477] p0102 N82-11248	Feasibility study for an alcohol-fuels plant for
Cool-down flow-rate limits imposed by thermal	Buffalo, New York
stresses in LNG pipelines	[DE82-000032] p0114 N82-14377
	PLAST STRESS :
[DE81-028731] p0150 N82-14484 PIPELINES	
	Investigation of the application of remote sensing
Cool-down flow-rate limits imposed by thermal	technology to environmental monitoring [E82-10010] p0030 N82-15488
stresses in LNG pipelines	
[DE81-028731] p0150 N82-14484	PLANTS (BOTANY)
Selection and testing of suitable coating systems	Geothermal environmental assessment: Behavior of
for steel ripes used for long distance heat	selected geothermal brine contaminants in plants
transfer	and soils
[BMFT-FB-T-81-138] p0150 N82-15134	[PB81-222333] p0015 N82-11671
Systems analysis of hydrogen/natural gas	Brogeochemical evidence for subsurface hydrocarbon
supplementation and separation	occurrence, recluse oil field, Wyoming:
[DE81-021383] p0087 N82-15220	Preliminary results
PIPES (TUBES)	[USGS-CIRC-837] p0110 N82-12693
Corrosion testing of carbon steel in aereated	PLASHA CHEMISTRY
geothermal brine	Introduction to basic aspects of plasma-deposited
[DE81-028653] p0093 N82-10201	amorphous semiconductor alloys in photovoltaic
Integrated function nonimaging concentrating	conversion .
collector tubes for sclar thermal energy	p0039 A82-10026
[DE81-029677] p0064 N82-10521	PLASMA CONDUCTIVITY
PISTON ENGINES .	Study of the electric conductivity of plasma from
Development free-piston Stirling test-bed engine	fuel combustion products containing a weakly
p0123 A82-11808	ionizing impurity
Modelling of the jet-stream Fluidyne	p0091 A82-12888
p0124 A82-11812	PLASMA CONTROL
PITTING	Nonlinear development of magnetic reconnection in
Corrosion testing of carbon steel in aereated	the tearing-type and the Petschek-type field
geothermal brine	geometries
[DE81-028653] p0093 N82-10201	p0132 A82-17015
PLANT DESIGN	Technology of controlled nuclear fusion
Preliminary design study of underground pumped	[DE81-027361] p0144 N82-15893
hydro and compressed-air energy storage in hard	PLASHA CURRENTS
	End region and current consolidation effects upon
rock. Volume 1: Executive summary [DE81-029440] p0155 N82-10527	
	the performance of an MHD channel for the ETF
Preliminary design study of underground pumped	conceptual design Engineering Test Facility
hydro and compressed-air energy storage in hard	[AIAA PAPER 82-0325] . p0135 A82-17889
rock. Volume 2: Project design criteria: UPH	PLASHA DYNAHICS
[DE81-028107] p0156 N82-10528	The plasmadynamics and ionization kinetics of
Preliminary design study of underground pumped	
	thermicnic energy conversion
hydro and compressed-air energy storage in hard	p0137 N82-10494
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES	PLASMA BLECTRODES p0 137 N82-10494
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] p0156 N82-10546	p0 137 N82-10494 PLASMA BLECTRODES Impact of uniform electrode current distribution
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] p0156 N82-10546 Preliminary design study of underground pumped	p0 137 N82-10494 PLASHA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] p0156 N82-10546	p0 137 N82-10494 PLASMA BLECTRODES Impact of uniform electrode current distribution
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] p0156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES	p0 137 N82-10494 PLASHA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] p0156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard	p0 137 N82-10494 PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17941
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] p0156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES	p0137 N82-10494 PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [ATAA PAPER 82-0423] p0135 A82-17941 PLASMA EQUILIBRIUM
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] p0156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] p0157 N82-10574	p0137 N82-10494 PLASMA BLECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAN PAPER 82-0423] p0135 A82-17941 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] pol56 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] pol57 N82-10574 Alternative fuel for the steel industry of	p0 137 N82-10494 PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17941 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a	p0137 N82-10494 PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17941 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11131
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] p0156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] p0157 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DE81-029314]	PLASMA BLECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17941 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11131
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] pol56 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] pol57 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DE81-029314] Peasibility and economic study of medium-BTU coal	p0137 N82-10494 PLASHA BLECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [ATAN PAPER 82-0423] p0135 A82-17941 PLASHA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11131 PLASHA GENERATORS Bigh pressure MHD coal combustors investigation,
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DB81-028197] poliso N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DE81-029314] Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an	p0137 N82-10494 PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS High pressure MHD coal combustors investigation, phase 2 [DE81-027238] p0138 N82-10888
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DB81-028197] p0156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DB81-028110] p0157 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DB81-029314] p0010 N82-11233 Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana	PLASMA BLECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS High pressure MHD coal combustors investigation, phase 2 [DEB1-027238] p0138 N82-10888 RF-driven Tokamak reactor with sub-ignited,
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] po156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] po157 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DE81-029314] po010 N82-11233 Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DE81-025166] po101 N82-11237	PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS High pressure MHD coal combustors investigation, phase 2 [DE81-027238] RF-driven Tokamak reactor with sub-ignited, thermally stable operation
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CABS [DB81-028197] po156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CABS [DE81-028110] po157 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DB81-029314] po010 N82-11233 Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DB81-025166] po101 N82-11237 Preliminary design study of underground pumped	PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS Bigh pressure MHD coal combustors investigation, phase 2 [DE81-027238] p0138 N82-10888 RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DB81-028197] pol56 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DB81-029314] Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DB81-025166] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard	p0137 N82-10494 PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17945 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS Bigh pressure MHD coal combustors investigation, phase 2 [DE81-027238] p0138 N82-10888 RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA HEATING
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] po156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] po157 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DE81-029314] po010 N82-11233 Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DE81-025166] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPB	PLASMA BLECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS Bigh pressure MHD coal combustors investigation, phase 2 [DE81-027238] p0138 N82-10888 RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA BEATING RF-driven Tokamak reactor with sub-ignited,
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] po156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] po157 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DE81-029314] po010 N82-11233 Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DE81-025166] po101 N82-11237 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPB [DE81-030673]	PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA RQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS High pressure MHD coal combustors investigation, phase 2 [DE81-027238] p0138 N82-10888 RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA HEATING RF-driven Tokamak reactor with sub-ignited, thermally stable operation
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CABS [DB81-028197] P0156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CABS [DE81-028110] P0157 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DB81-029314] P0010 N82-11233 Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DB81-025166] P0101 N82-11237 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPB [DB81-030673] Development, testing, and evaluation of HHD	PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS Bigh pressure MHD coal combustors investigation, phase 2 [DE81-027238] p0138 B82-10888 RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA BENTING RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DB81-028197] Pol56 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DB81-029314] Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DB81-025166] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPB [DB81-030673] Development, testing, and evaluation of HHD materials and component designs. Volume 1:	PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS High pressure MHD coal combustors investigation, phase 2 [DE81-027238] RP-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA HEATING RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA JETS
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] po156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] po157 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DE81-029314] po010 N82-11233 Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DE81-025166] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Development, testing, and evaluation of MHD materials and component designs. Volume 1: Executive summary	PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17941 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11131 PLASMA GENERATORS High pressure MHD coal combustors investigation, phase 2 [DE81-027238] p0138 N82-10888 RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA HEATING RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA JETS Introduction to basic aspects of plasma-deposited
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DB81-028197] Pol56 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DB81-029314] Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DB81-025166] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPB [DB81-030673] Development, testing, and evaluation of HHD materials and component designs. Volume 1:	PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS High pressure MHD coal combustors investigation, phase 2 [DE81-027238] p0138 N82-10888 RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA HEATING RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA JETS Introduction to basic aspects of plasma-deposited amorphous semiconductor alloys in photovoltaic
hydro and compressed-air energy storage in hard rock. Volume 3: Project design criteria: CAES [DE81-028197] po156 N82-10546 Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] po157 N82-10574 Alternative fuel for the steel industry of Northern Indiana: A prefeasibility study of a central coal gasification project [DE81-029314] po010 N82-11233 Peasibility and economic study of medium-BTU coal gas blended with high-BTU by product gas as an industrial energy source at Billings, Montana [DE81-025166] Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 8: Design approaches: UPH [DE81-030673] Development, testing, and evaluation of MHD materials and component designs. Volume 1: Executive summary	PLASMA ELECTRODES Impact of uniform electrode current distribution on ETF Engineering Test Facility MHD generator [AIAA PAPER 82-0423] p0135 A82-17947 PLASMA EQUILIBRIUM The tilting mode in field-reversed configurations stability of toroidal plasma equilibria p0121 A82-11137 PLASMA GENERATORS High pressure MHD coal combustors investigation, phase 2 [DE81-027238] p0138 N82-10888 RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA HEATING RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 PLASMA HEATING RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935 Introduction to basic aspects of plasma-deposited

Sulfur pollution control. Phase 1: The disposal PLASMA WAVES program (sections 5 through 7) Ionization waves in an argon discharge in a p0015 N82-11655 longitudinal gas flow [PB81-222804] Vapor-phase cracking and wet oxidation as potential pollutant control techniques for coal p0127 A82-12666 PLASMA-RLECTROMAGNETIC INTERACTION Space chamber experiments of ohmic heating by high gasification p0015 N82-11661 power microwave from the Sclar Power Satellite [PB81-219594] BPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 882-11679 p0145 A82-16991 PLASTIC COATIEGS Selection and testing of suitable coating systems for steel pipes used for long distance heat PGDIS primer: Major equipment/component classifications, problem/solution access codes, and definitions related to FGD systems as transfer contained in the Flue Gas Desulfurization [BMFT-FB-T-81-138] Information System (PGDIS) PLASTIC PROPERTIES H-Coal product physical properties measurement [DR81-029095] p0111 H82-PLATE THEORY [PB81-225948] p0016 N82-11985 p0111 N82-13245 Pixed-bed gasification [DE82-000432] [DB82-000432] p0108 N82-12261 Preliminary study: Use of low-sulfur coal and Application of orthotropic plate theory to coal cleaning in control of acid rain windmill blade design p0021 N82-12675 p0121 A82-10978 [DE81-028930] Sulfur in the air in the capital (Helsinki)
metropolitam area: ITASAT-project Model calculations of the chemical processes occurring in the plume of a coal-fired power plant p0005 182-16342 [RR-614.71] p0025 N82-13553 Environmental hazard rankings of pollutants Environmental effects of pollutants from coal generated in coal gasification processes combustion. 2: The Cclstrip, Montana Power Plant [PB81-234114] p0026 882-13573 p0026 N82-13576 [PB81-231698] Sampling and analysis of potential geothernal sites
[PB81-240061] p0119 N82-15593
Kinetics of reactions in a wet flue gas p0026 N82-13573 PLUTONTER p0119 N82-15593 Plutonium thermochemical solar cell p0043 A82-11215 simultaneous desulfurization and denitrification PLUTCHIUM ISOTOPES system Space nuclear safety and fuels program [DE81-029853] p0111 N82-12921 Real time coarse particle mass measurements in a high temperature and pressure coal gasifier Space nuclear safety and fuels program process treatment [DE81-030036] [DE81-030036] p0033 N82-15609 Symposium proceedings: Environmental aspects of p0111 #82-12921 PERUMATIC EQUIPMENT Coal and limestone feed testing for atmospheric fuel conversion technology, 5th fluidized bed combustion [PB81-245045] Demonstration of Wellman-Lord/Allied Chemical FGD [DE81-030629] p0117 N82-15222 technology: Demontration test second year results [PB81-246316] p0034 N82-15626 POINT SOURCES Selected studies of four high-temperature air-pollution sources Proceedings: Symposium on Plue Gas Desulfurization, volume 1 p0015 N82-11680 [PB81-243156] POINTING CONTROL SYSTEMS p0035 N82-15651 Simple tracking strategies for solar concentrations POLLUTION MONITORING p0042 A82-11207 Pingerprinting pollutant discharges from synfuels plants D0001 A82-10697 Building a consensus about energy technologies [DE82-000501] p0024 N82-13536 Rate coefficients of combustion/fuel conversion POLLUTION CONTROL reactions by high-temperature photochemistry An overview of fluidized-bed combustion /FBC/ [DE81-027965] p0023 N82-1319
Investigation of the application of remote sensing p0023 N82-13192 design practice p0090 A82-11850 technology to environmental monitoring
[E82-10010] p0030 N82-15488 Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3: Emissions POLLUTICE TRANSPORT Chemical and geochemical studies off the coast of evaluation p0006 N82-10254 [DE81-903764] Washington Oil and gas industry and environmental pollution: p0017 N82-12513 [DE81-030319] Application of systems reliability analysis for the evaluation of the status of environmental pollution control in the Bigerian petroleum Three-dimensional, finite elemental model for simulating heavier-than-air gaseous releases over variable terrain industrv [DE81-028689] p0008 N82-10583 Rlemental composition of atmospheric fine-particles emitted from coal burned in a Environmental compliance program handbook p0008 N82-10585 modern electric power plant equipped with a flue-qas desulfurization system [DE81-030226] Study of the formation of submicron particulates generated by coal combustion [DE81-027447] [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios Coal gasifier parameters influencing environmental. pollutant production p0011 N82-11273 [PB81-221301] p0011 N82-1127.
An evaluation of three-way control single and dual bed catalysts as applied to heavy-duty gasoline [DE81-030096] p0033 N82-15613 POLYCRYSTALS Advances in photovoltaics R&D - An overview p0047 A82-11793 engines [PB81-224982] p0012 N82-11477 Grain size dependence of the photovoltaic Intergrated assessment for energy-related properties of solar grade polysilicon p0057 A82-16051 environmental standards: A summary of issues Photoelectrochemical cells using polycrystalline and thin film MoS2 electrodes and findings p0014 N82-11646 [DE81-028552] Sulfur pollution control. Phase 1: The disposal A study of the purification process during the program elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic [PB81-222612] Control of utility boiler and gas turbine pollutant emissions by combustion modification, conversion p0057 A82-16054 phase 2 [PB81-222267] . p0015 N82-11654

High efficiency inversion layer solar cells on	POWER EPFICIENCY
polycrystalline silicon by the application of	Introduction to photovoltaics - Physics, materials and technology
silicon nitride p0058 A82-16127	p0038 A82-10022
A method for experimental assessment of the	Analysis of power, mass, and size parameters of
shifting approximation, with application to	solar vapor-turbine two-circuit systems with
polysilicon solar cells effect of constant	organic working bodies
series resistance	p0044 A82-11421
p0058 A82-16131	Small sodium sulfur battery for solar and wind
Thin-film polycrystalline cadmium telluride solar	energy systems
cells and large-area polycrystalline silicon	p0047 A82-11778
solar cells	Design considerations for a 1500 H head 300-600 HW
p0062 N82-10490	double stage reversible pump/turbine with
Investigation of photovoltaic mechanisms in	regulation p0154 A82-11782
polycrystalline thin-film solar cells [DE81-027272] p0065 N82-10539	Characteristics of CVD silicon carbide thermionic
Photoelectrochemical sclar cells: Stabilization	converters
of small-band-gap semiconductor in aqueous	p0124 A82-11821
solution by surface-attached organic conducting	Increasing power and efficiency by dynamic
polymer	suppression of ionization instability in a plasma
[DE81-030312] p0081 N82-15569	p0127 A82-12897
POLYMERS	A design for an MHD power plant as a prime mover
Field demonstration of the conventional steam	for a Naval Vessel [AIAA PAPER 81-2575] p0129 A82-14032
drive process with ancillary materials [DE81-026849] p0115 882-14522	[AIAA PAPER 81-2575] p0129 A82-14032 Problems and potential for MHD retrofit of
[DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam	existing coal-fired plants
drive process with ancillary materials	[AIAA PAPER 81-2586] p0130 A82-14036
[DE81-026962] p0115 N82-14523	On the efficiency of thermal engines with power
POLYHUCLEAR ORGANIC COMPOUNDS	output - Harmonically driven engines
Identification and toxicity of	p0 131 182-14489
fractionated-shale-oil components	Energy potential and early operational experience
[DE81-028460] p0021 N82-12766	for large wind turbines
POROUS MATERIALS	p0132 A82-17627 Evaluation of wind turbine generator operational
Mechanically stable hydride composites designed for rapid cycling	hysteresis using 'Method of Bins'
p0084 A82-16347	p0 133 A82-17636
POTASSIUM	Liquid-metal MHD for solar and coal
Mass spectrometric studies of MHD slag	[DE81-023545] p0137 N82-10553
thermochemistry	Intermediate photovoltaic system application
[PB81-221434] p0138 N82-11173	experiment operational performance report.
Laboratory study for removal of organic sulfur	Volume 2 for Beverly High School, Beverly, Mass.
from coal	
	[DE82-000811] p0077 N82-13532
[DE81-025132] p0010 N82-11239	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations
[DE81-025132] p0010 N82-11239	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOES	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATORS Methane production from alkaline food waste	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOES Methane production from alkaline food waste p0092 N82-10115	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES)	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOES Methane production from alkaline food waste p0092 N82-10115	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATORS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric fower plant eguipped with a flue-gas desulfurization system	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES Hethane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] POUND NOTATION OF THE PROPERTY OF THE PROP	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE61-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Assessment of the lcng-range transport of	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATORS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric fower plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MBD generator
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOBS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Assessment of the long-range transport of residential woodstove fine-particulate emissions for two fluture United States energy scenarios [DE81-030096] p0033 N82-15613	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MBD generator
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATORS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric fower plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MBD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTER) Aluminum recovery from fly ash and shale-retort wastes
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric rower plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096]' p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATORS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATORS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Satellite power systems /SPS/ energy conversion	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE61-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MED generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096]' POWDER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems PO045 A82-11738 Satellite power management	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 NW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATORS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Satellite power systems /SPS/ energy conversion	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Satellite power systems /SPS/ energy conversion and power management P0045 A82-11742 Advances in space power research and technology at the National Aeronautics and Space Administration	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIECUITS Loading schemes for a 50 MW/th/ diagonally connected MBD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOC/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDRE (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Satellite power systems /SPS/ energy conversion and power management p0045 A82-11742 Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [ATAM PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Satellite power systems /SPS/ energy conversion and power management p0045 A82-11742 Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOBS POTATOBS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems PO045 A82-11738 Satellite power systems /SPS/ energy conversion and power management PO045 A82-11742 Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt spacecraft power systems	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE61-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MBD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] PRESIDENTIAL REPORTS Aeronautics and space report of the President,
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications p0137 N82-10493 POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Satellite power systems /SPS/ energy conversion and power management p0045 A82-11742 Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems P0045 A82-11738 Satellite power systems /SPS/ energy conversion and power management Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt spacecraft power systems	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected HBD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605 PRESIDENTIAL REFORTS Aeronautics and space report of the President, 1980 activities [NASA-TH-84079] p0035 N82-16022 PRESSURE VESSEL DESIGN
[DE81-025132] p0010 N82-11239 POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Satellite power systems /SPS/ energy conversion and power management Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt spacecraft power systems p0046 A82-11769 The evaluation of four solar-array-powered multi-kW power conditioners for Space Shuttle Orbiter application	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE61-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MED generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE61-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [D0E/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE61-904192] p0033 N82-15605 PRESIDENTIAL REPORTS Aeronautics and space report of the President, 1980 activities [NASA-TH-84079] p0035 N82-16022 PRESSURE VESSEL DESIGN Novel design of pressure vessels and thermal
POTA SSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES POTATOES Hethane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096]' POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems /SPS/ energy conversion and power management Advances in space power research and technology at the National Aeronautics and Space Administration p122 A82-11755 Power management of multi-hundred kilowatt spacecraft power systems PO046 A82-11769 The evaluation of four solar-array-powered multi-kW power conditioners for Space Shuttle Orbiter application PO046 A82-11772	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MBD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOC/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605 PRESIDENTIAL REFORTS Aeronautics and space report of the President, 1980 activities [NASA-TM-84079] p0035 N82-16022 PRESSURE VESSEL DESIGN Novel design of pressure vessels and thermal shields in coal gasifiers
POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATORS POTATORS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096]' POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems PO045 A82-11738 Satellite power systems /SPS/ energy conversion and power management PO045 A82-11742 Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt spacecraft power systems PO046 A82-11769 The evaluation of four solar-array-powered multi-kW power conditiorers for Space Shuttle Orbiter application PO046 A82-11772 Control of new energy sources in an electric	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605 PRESIDENTIAL REFORTS Aeronautics and space report of the President, 1980 activities [NASA-TM-84079] p0035 N82-16022 PRESSURE VESSEL DESIGN Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474
POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant eguipped with a flue-gas desulfurization system [DE81-030073] Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems PO045 A82-11738 Satellite power systems /SPS/ energy conversion and power management Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt spacecraft power systems PO046 A82-11769 The evaluation of four solar-array-powered multi-kW power conditioners for Space Shuttle Orbiter application PO046 A82-11772 Control of new energy sources in an electric utility system	Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MBD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CERMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605 PRESIDENTIAL REPORTS Aeronautics and space report of the President, 1980 activities [NASA-TM-84079] p0035 N82-16022 PRESSURE VESSEL DRSIGN Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURE VESSELS
POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWDER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Satellite power systems /SPS/ energy conversion and power management p0045 A82-11742 Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt spacecraft power systems p0046 A82-11769 The evaluation of four solar-array-powered multi-kW power conditiorers for Space Shuttle Orbiter application p0046 A82-11772 Control of new energy sources in an electric utility system p0154 A82-13082	[DE82-000811] p0077 N82-13532 Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605 PRESIDENTIAL REFORTS Aeronautics and space report of the President, 1980 activities [NASA-TM-84079] p0035 N82-16022 PRESSURE VESSEL DESIGN Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474
POTASSIUM HYDROXIDES Pundamental investigations on fuel cells for transportation applications POTATOES Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWDER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems PO045 A82-11738 Satellite power systems /SPS/ energy conversion and power management PO045 A82-11742 Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt spacecraft power systems PO046 A82-11769 The evaluation of four solar-array-powered multi-kW power conditioners for Space Shuttle Orbiter application PO046 A82-11772 Control of new energy sources in an electric utility system PO154 A82-13082 Workshop on Microwave Fower Transmission and Reception. Workshop paper summanies	Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLISS Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MBD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHERISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027' N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605 PRESIDENTIAL REPORTS Aeronautics and space report of the President, 1980 activities [NASA-TM-84079] p0035 N82-16022 PRESSURE VESSEL DRSIGH Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474
DR81-025132 P0010 N82-11239	Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LIBES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-02923] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605 PRESIDENTIAL REPORTS Aeronautics and space report of the President, 1980 activities [NASA-TM-84079] p0035 N82-16022 PRESSURE VESSEL DESIGN Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURE VESSELS Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURIZEG
POTASSIUM HYDROXIDES Fundamental investigations on fuel cells for transportation applications POTATORS Methane production from alkaline food waste p0092 N82-10115 POWDER (PARTICLES) Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant eguipped with a flue-gas desulfurization system [DE81-030073] p0033 N82-15610 Assessment of the long-range transport of residential woodstove fine-particulate emissions for two future United States energy scenarios [DE81-030096] p0033 N82-15613 POWDER CONDITIONING High power solar array switching regulation p0045 A82-11736 Series vs. shunt regulators for power control in satellite power systems p0045 A82-11738 Satellite power systems /SPS/ energy conversion and power management p0045 A82-11742 Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Power management of multi-hundred kilowatt spacecraft power systems p0046 A82-11769 The evaluation of four solar-array-powered multi-kW power conditioners for Space Shuttle Orbiter application p0046 A82-11772 Control of new energy sources in an electric utility system p0154 A82-13082 Workshop on Microwave Fower Transmission and Reception. Workshop paper summaries [NASA-TM-64064] p0146 N82-12538 Satellite power system: Concept development and	Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LINES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-029323] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MBD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605 PRESIDENTIAL REPORTS Aeronautics and space report of the President, 1980 activities [NASA-TM-84079] p0035 N82-16022 PRESSURE VESSEL DESIGN Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURE VESSELS Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURE VESSELS Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURE VESSELS Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURE VESSELS Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURE VESSELS Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474
DR81-025132 P0010 N82-11239	Comparative analyses of space-to-space central power stations [NASA-TP-1955] p0150 N82-14202 POWER LIBES Cryogenic testing of 100-m superconducting power transmission test facility [DE81-028331] p0150 N82-13517 Improved technique to measure electronically AC losses in superconducting cables [DE81-02923] p0150 N82-15338 POWER SUPPLIES Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER SUPPLY CIRCUITS Loading schemes for a 50 MW/th/ diagonally connected MHD generator [AIAA PAPER 82-0395] p0135 A82-17923 PRECIPITATION (CHEMISTRY) Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] p0099 N82-11154 PREDICTION ANALYSIS TECHNIQUES Projecting regional potentials for cost-effective energy conservation and renewable resource applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645 Regional load-curve models: Scenario and forecast using the DRI model [DE81-904192] p0033 N82-15605 PRESIDENTIAL REPORTS Aeronautics and space report of the President, 1980 activities [NASA-TM-84079] p0035 N82-16022 PRESSURE VESSEL DESIGN Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURE VESSELS Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 PRESSURIZEG

SUBJECT INDEX PROTON IRRADIATION

PRETREATMENT	Field demonstration of the conventional steam
Partial acid hydrolysis pretreatment for enzymatic	drive process with ancillary materials
hydrolysis of cellulose: A process development study of ethancl production	[DB81-026962] p0115 N82-14523 Potential contribution of currently operating
p0107 N82-12236	nuclear-fueled electric-generating units to
PROBLEM SOLVING Case studies in the application of air quality	reducing US oil consumption [DE81-030497] p0031 N82-15553
modelling in environmental decision making:	[DE81-030497] p0031 N82-15553 PROJECT MANAGEMENT
Summary and recommendations	Application of large and small wind turbine
[PB81-213233] p0009 N82-10605	generators - A utility perspective
Soviet UCG experience specifically related to field experiments in the United States	p0133 A82-17629 Overview of the Wind Energy Application Network
[DE81-028642] p0111 N82-13244	for Hawall
PROCESS CONTROL (INDUSTRY)	p0133 A82-17634
High-mass-flux coal gasifier [DE81-029807] p0094 N82-10257	Quarterly report of solar federal buildings program in the MASEC region
Demonstration of Wellman-Lord/Allied Chemical FGD	[DE81-027968] p0062 N82-10276
technology: Demontration test second year results	Project impact analysis as an optimal control
[PB81-246316] p0034 N82-15626 PROCESS BEAT	<pre>problem irrigation and hydroelectric power project</pre>
Application of HTGR process heat to cil shale	[DE81-028465] p0021 N82-12842
retorting -0000 102-11051	Natural gas plan needed to provide greater
p0090 A82-11851 Design, cost and performance comparisons of	protection for high-priority and critical uses [PB81-228488] p0023 N82-13255
several solar thermal systems for process heat.	PROJECT PLANNING
Volume 1: Executive summary	Project demonstration of wind-turbine electricity:
[DB81-029881] p0069 N82-11576 Residual-energy-applications program:	Interconnecting a northern Michigan fruit farm with a major utility
EAST-facility requirements document	[DB81-030950] p0138 N82-11380
[DE81-027489] p0014 N82-11616	DOE solar-assisted heat-pump program: Its
Guidebook for solar process-heat applications [DE81-027977] p0072 N82-12598	evolution and its potential [DE81-026055] p0067 N82-11413
Comparative economics of solar thermal central	Planning a comprehensive program for exploration
receivers	of the anthracite deposits of the Narragansett
[DE81-029623] p0072 N82-12601 Status of solar energy research and development in	Basın of Massachusetts and Rhode Island, phase 1 and 2
Australia	[DE81-028490] p0104 N82-11519
[NP-1903916] 'p0073 N82-12611	Great Plains gasification project, Mercer County,
Solar thermal central receivers for industrial process heat generation: User views and	North Dakota; water assessment report section 13(c)
recommendations for commercialization	[PB81-216111] p0013 N82-11524
[DB81-029611] p0073 N82-12618	Great Plains gasification project, Mercer County,
Fuels and chemicals made from solar energy [DE81-025018] p0077 N82-14384	North Dakota; water assessment report [PB81-216129] p0013 N82-11525
SERI Solar-Energy-Storage Program	Project for reliability fleet testing of
[DE81-029476] p0082 N82-15576	alconol/gasoline blends
Real-time coarse-particle mass measurements in a high-temperature/pressure coal-gasifier process	[DE82-000004] p0107 N82-12250 LLNL 1981: Technical horizons
treatment	[DE81-028265] p0026 N82-14048
[DE81-030039] p0119 N82-15604	Analysis of the energy impacts of the DOE
Demonstration of Wellman-Lord/Allied Chemical FGD technology: Demontration test second year results	Appropriate Energy Technology Small Grants Program: Method and results
[PB81-246316] p0034 N82-15626	[DE81-029844] p0028 N82-14651
PRODUCT DEVELOPMENT	Application of an LP model to strategic planning
Florida's proposed OTEC pilot plant for Key West [AIAA PAPER 81-2563] p0003 A82-14021	of multinational cooperative RD and D programs [DE81-029325] p0035 N82-16014
DOE solar-assisted heat-rump program: Its	PROJECTS
evolution and its potential [DE81-026055] p0067 N82-11413	Department of Energy projects
Solar cell development for the power extension	[DE82-000038] p0018 N82-12579 PROPULSION SYSTEM PERFORMANCE
package	Assessment of flywheel system benefits in selected
[NASA-TM-82685] p0068 N82-11551 High efficient collector for small solar-powered	vehicle applications [DE81-025976] p0158 N82-11997
facilities	[DE81-025976] p0158 N82-11997 propulsive Efficiency
[BMFT-FB-T-81-156] p0080 N82-15538	Assessment of I.C. engines as drivers for heat
PRODUCTION COSTS	actuated heat pumps
Agricultural policies and biomass fuels p0001 A82-11542	[DE81-024086] p0139 N82-11421 PROTECTIVE CONTINGS
Small-scale uses and costs of hydrogen derived	Characteristics of CVD silicon carbide thermionic
from OTEC ammonia	converters
p0084 A82-11792 Assessment of potential future markets for the	p0124 A82-11821 Lightning protection for composite rotor blades
production of hydrogen from water	of windpowered turbines
[BMFT-FB-T-81-012] p0086 N82-12266 PRODUCTION ENGINEERING	p0133 A82-17631
Effects of processing parameters on thick film	Selection and testing of suitable coating systems for steel pipes used for long distance heat
inks used for solar cell front metallization	transfer
p0058 A82-16474 Soviet UCG experience specifically related to	[BHFT-FB-T-81-138] p0150 N82-15134
field experiments in the United States	Photoelectrochemical solar cells: Stabilization of small-band-gap semiconductor in aqueous
[DE81-028642] p0111 N82-13244	solution by surface-attached organic conducting
A Module Experimental Process System Develorment Unit (MEPSDU)	polymer [DE81-030312] p0081 N82-15569
[NASA-CR-165014] D0076 N82-13496	[DE81-030312] p0081 N82-15569 PROTOB IRRADIATION
Field demonstration of the conventional steam	Effects of low temperature periodic annealing on
drive process with ancillary materials [DE81-026849] p0115 N82-14522	tne deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells
[DE81-026849] p0115 N82-14522	p0061 A82-18287

PROTOTIPES	ill colar	High thermal power density heat tran	nefor
Development of a prototype of a 10 kW sma power plant technology for developi	ing nations	thermionic converters	nsier
[BHFI-FB-T-81-101] p008	30 N82-15532	[NASA-CASE-LEW-12950-1]	p0139 N82-11399
PSYCHOACOUSTICS		Magnetohydrodynamic research prógram	
Establishment of noise acceptance criteri	ia for	Energy center at Mississippi State	
wind turbines	5 -00 44005	and structural features of MHD rad	
•	25 A82-11825	[DB81-029901]	p0139 N82-11934
PULSE CHARGING		RADIATION CHEMISTRY	hudrogen
Effect of positive pulse charge waveforms energy efficiency of lead-acid traction		Solar chemistry of metal complexes production	Mydlogen
	55 N82-10503	P2 02 00 0 2 0 0	p0058 A82-16124
PULSE GENERATORS		RADIATION DAMAGE	• • • • • • • • • • • • • • • • • • • •
Techniques and applications of pulsed pow	er	Solar cell development for the power	r extension
technology		package	
	33 A82-11722	[NASA-TH-82685]	·p0068 R82-11551
Pulsed Power Research colloquium [AD-A105770] p015	50 N82-14638	PADIATION DISTRIBUTION Focal plane flux distributions prod	nced by solar
PURIFICATION	00 802-14030	concentrating reflectors	acea my norar
A study of the purification process during	ig the	, document	p0043 'A82-11211
elaboration by electron bombardment of		RADIATION EFFECTS	
polysilicon ribbons designed for photov	oltaic	Chronic exposure of a honey bee col	ony to 2.45 GHz
CONVERSION	7 .00 4605#	continuous wave microwaves	-0002 102 10202
PYROBLECTRICITY	57 A82-16054 ₋	RADIATION HARDENING	p0003 A82-14347
Regenerative pyroelectric heat engine		Gals solar cells for space applicat:	ion
	26 A82-11833	ours soldt cells for space applicas.	p0046 A82-11766
PYROLYSIS		BADIATION HAZARDS	•
Production of synthetic crude oil from co	oal using	Environmental and radiological safe	
the TOSCOAL pyrolysis process	-	Interaction of (238) PuO2 heat so	
	90 A82-11849	terrestrial and aquatic environmen	
Application of HTGR process heat to cil s	shale	[DE81-032019]	p0025 N82-13565
retorting	90 A82-11851	Comparison of potential radiological from a spent-fuel repository vers	
Synthetic-fuel combustion; pollutant form		natural-uranium deposits	. ,
Soot-initiation mechanisms in burning a		[DE81-028232]	p0029 N82-14910
[DE81-029480] p009	93 N82-10155	RADIATION PROTECTION	
Kinetics and catalysis of producing synth	etic	Overview of the blomedical and envi	
gases from bicmass	NE WAS 440330	programs at the Oak Ridge National	
[PB81-217614] p009 Surface coal gasification	95 N82-10272	[DE81-027864] RADIATIVE HEAT TRANSFER	p0021 N82-12765
	02 N82-11253	The emissivity of metals frequen	ncv and
Pyrolysis of coal-drived fuels using the		temperature dependence calculation	ns for solar
	-1		-
laser-powered homogeneous pyrolysis ted	cunique	collector design	
[DE82-000251] p010	2011 que 26 N82-12196		p0038 A82-10014
[DE82-000251] p010 Controlled-flash pyrolysis	06 N82-12196	Correlation between results of zone	method and
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011	06 N82-12196 11 N82-13196	Correlation between results of zone experiment in radiative heat trans	method and sfer
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical	06 N82-12196 11 N82-13196 Ls	Correlation between results of zone experiment in radiative heat tran: [ASME PAPER 81-HT-71]	method and sfer p0121 A82-10958
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007	06	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-BT-71] Calculation of the top loss coeffic.	method and sfer p0121 A82-10958 ient by the
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic	06 N82-12196 11 N82-13196 Ls 77 N82-13530 c matter	Correlation between results of zone experiment in radiative heat tran: [ASME PAPER 81-HT-71]	method and sfer p0121 A82-10958 ient by the
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devomian s southern West Virginia	06 N82-12196 11 N82-13196 15 17 N82-13530 12 matter 15 matter	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors	method and sfer p0121 A82-10958 ient by the
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devomian s southern West Virginia	06 N82-12196 11 N82-13196 15 77 N82-13530 : matter Shales of	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coefficing network method and applications to collectors RADIO PREQUENCY HEATING	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devomian s southern West Virginia	06 N82-12196 11 N82-13196 15 17 N82-13530 12 matter 15 matter	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coefficing network method and applications to collectors RADIO FREQUENCY HEATING RF-driven Tokamak reactor with sub-	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devomian s southern West Virginia	06 N82-12196 11 N82-13196 15 17 N82-13530 12 matter 15 matter	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO PREQUENCY HEATING RF-driven Tokamak reactor with sub- thermally stable operation	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited,
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devomian s southern West Virginia p016	06 N82-12196 11 N82-13196 15 17 N82-13530 15 matter 16 matter 18 N82-13578	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RF-driven Tokamak reactor with sub- tnermally stable operation [DE81-029437]	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia Q QUALITY COETROL	06 N82-12196 11 N82-13196 15 77 N82-13530 15 matter 15 matter 13 N82-13578	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coefficing network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with subthermally stable operation [DE81-029437] RADIO RECEPTION	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devomian s southern West Virginia p016	06 N82-12196 11 N82-13196 15 77 N82-13530 15 matter 15 matter 13 N82-13578	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RF-driven Tokamak reactor with sub- tnermally stable operation [DE81-029437]	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia Q QUALITY COMTROL Standards application and development pla solar thermal technologies	06 N82-12196 11 N82-13196 15 77 N82-13530 15 matter 15 matter 13 N82-13578	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- tnermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powers	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian's southern West Virginia Q QUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p006	06 N82-12196 11 N82-13196 15 N82-13530 17 N82-13530 18 matter 18 Shales of 13 N82-13578 10 for 15 N82-10534	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RF-driven Tokamak reactor with subthermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 M82-11935 er transmission p0145 A82-11743
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p017 QUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALISIS Vaporization and chemical transport under	06 N82-12196 11 N82-13196 15 N82-13530 17 N82-13530 18 matter 18 Shales of 13 N82-13578 10 for 15 N82-10534	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coefficing network method and applications to collectors RADIO PREQUENCY HEATING RF-driven Tokamak reactor with subthermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 M82-11935 er transmission p0145 A82-11743 the GPHS-RTG
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p017 Q QUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions	06 N82-12196 11 N82-13196 15 N82-13530 2 matter 25 Shales of 13 N82-13578 2 mn for 15 N82-10534 3 coal	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RF-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Hea	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian's southern West Virginia Q QUALITY COHTROL Standards application and development plates solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p017	06 N82-12196 11 N82-13196 15 N82-13530 17 N82-13530 18 matter 18 Shales of 13 N82-13578 10 for 15 N82-10534	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- tnermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Hea Source-Radioisotope Thermoelectri	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian's southern West Virginia Q QUALITY COBTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] QUANTUM EPPICIENCY	26 N82-12196 11 N82-13196 15 N82-13530 2 matter 35 N82-13578 2 na for 35 N82-10534 37 N82-15165	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RF-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Hea	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian's southern West Virginia Q QUALITY COHTROL Standards application and development plates solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p017	06 N82-12196 11 N82-13196 15 N82-13530 2 matter 25 shales of 13 N82-13578 2 na for 25 N82-10534 3 coal 17 N82-15165	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- tnermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Hea Source-Radioisotope Thermoelectri	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 M82-11935 er transmission p0145 A82-11743 the GPHS-RTG t c Generator for
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian's southern West Virginia [OUBLITY CONTROL Standards application and development plates of the solar thermal technologies [DE81-030310] p006 [DE81-03	26 N82-12196 11 N82-13196 15 N82-13530 15 matter 16 shales of 13 N82-13578 15 N82-13578 16 coal 17 N82-15165 16 solar cells 18 N82-11185	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- tnermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectricalileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p016 QUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTIATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] QUANTUM REPTICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascade	26 N82-12196 11 N82-13196 15 N82-13530 15 matter 16 shales of 13 N82-13578 15 N82-13578 16 coal 17 N82-15165 16 solar cells 18 N82-11185	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RF-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Hea Source-Radioisotope Thermoelectri Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 M82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian's southern West Virginia Q QUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] QUANTUM EFFICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier's p000 The development of high efficiency cascade cells - An overview	06 N82-12196 11 N82-13196 15 N82-13530 16 matter 17 N82-13578 18 N82-13578 19 For Coal 17 N82-15165 19 N82-11185 19 N82-11185 10 N82-11185	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with subthermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectricalileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An interpretable of the coverview [DE81-026334]	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 M82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 M82-12924
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p017 Q QUALITY CONTROL Standards application and development plat solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p017 QUANTUM EPPICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p007 The development of high efficiency cascad cells - An overview	26 N82-12196 11 N82-13196 15 N82-13530 15 matter 16 shales of 13 N82-13578 15 N82-13578 16 coal 17 N82-15165 16 solar cells 18 N82-11185	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RP-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologica	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p017 Q QUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p017 QUANTUM EPFICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascad cells - An overview p006 Zn0 - p-InP heterojunction solar cells	06 N82-12196 11 N82-13196 15 N82-13530 16 matter 17 N82-13578 18 N82-13578 19 For Coal 17 N82-15165 19 N82-11185 19 N82-11185 10 N82-11185	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- tnermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectricalileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologica from a spent-fuel repository vers	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p000 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia Q QUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] QUANTUM EFFICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier in p000 The development of high efficiency cascad cells - An overview p000 ZnO - p-InP heterojunction solar cells p0001 Thin-film gallium arsenide homojunction s	06 N82-12196 11 N82-13196 15 N82-13530 16 matter 17 N82-13578 18 N82-13578 19 For Coal 17 N82-15165 19 M82-11185 19 M82-11185 19 M82-11185 19 M82-11794 19 M82-11794 19 M82-12821	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologica from a spent-fuel repository vers natural-urannum deposits [DE81-028232]	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p016 Q QUALITY COETROL Standards application and development plat solar thermal technologies [DE81-030310] p006 QUANTITATIVE ABALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p017 QUANTUM EPPICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascad cells - An overview 2n0 - p-InP heterojunction solar cells p006 Thin-film gallium arsenide homojunction s	06 N82-12196 11 N82-13196 15 N82-13530 16 matter 13 N82-13578 16 for 16 N82-10534 17 N82-15165 18 N82-15165	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffice network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- tnermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologica from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences p0029 N82-14910
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p016 QUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTIATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] QUANTUM EPPICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascad cells - An overview Zno - p-InP heterojunction solar cells Thin-film gallium arsenide homojunction s p006 QUENCHING (ATOMIC PHYSICS)	06 N82-12196 11 N82-13196 15 N82-13530 16 matter 17 N82-13578 18 N82-13578 19 For Coal 17 N82-15165 10 US 18 Solar Cells 19 A82-11185 19 Solar 19 Solar Cells 19 Solar 19 Solar Cells 19 Solar 19 Solar Cells 20 Solar 21 N82-12821 22 N82-13200	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologica from a spent-fuel repository vers natural-urannum deposits [DE81-028232]	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 M82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 M82-12924 1 consequences us p0029 M82-14910 erator
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p010 QUALITY COBTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p010 QUANTUM RPFICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p000 The development of high efficiency cascad cells - An overview ZnO - p-InP heterojunction solar cells Thin-film gailium arsenide homojunction s p000 QUENCHING (ATOMIC PHYSICS) Infrared quenching of photocapacitance in	06 N82-12196 11 N82-13196 15 N82-13530 16 matter 17 N82-13578 18 N82-13578 19 For Coal 17 N82-15165 10 US 18 Solar Cells 19 A82-11185 19 Solar 19 Solar Cells 19 Solar 19 Solar Cells 19 Solar 19 Solar Cells 20 Solar 21 N82-12821 22 N82-13200	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RF-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powent and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicat from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Modular isotopic thermoelectric gen	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 M82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 M82-12924 consequences us p0029 M82-14910 erator p0122 A82-11753
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p000 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia [OUALITY CONTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 [QUALITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] [QUANTUM EFFICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascad cells - An overview p006 ZnO - p-InP heterojunction solar cells Thin-film gallium arsenide homojunction s p009 QUENCHING (ATOMIC PHYSICS) Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells	06 N82-12196 11 N82-13196 15 N82-13530 2 matter 25 Shales of 13 N82-13578 An for 15 N82-10534 2 Coal 17 N82-15165 2 N82-11185 3 Solar Cells 42 A82-11185 3 Solar 47 A82-12621 3 Solar Cells 52 A82-13200 2 N82-13200	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RP-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powe and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicat from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Hodular isotopic thermoelectric gen	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences us p0029 N82-14910 erator p0122 A82-11753 stems -
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p017 Q QUALITY COBTROL Standards application and development plat solar thermal technologies [DE81-030310] p006 QUANTITATIVE ABALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p017 QUANTUM EPPICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascad cells - An overview ZnO - p-InP heterojunction solar cells p007 Thin-film gallium arsenide homojunction s p007 QUENCHING (ATOMIC PHYSICS) Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells	06 N82-12196 11 N82-13196 15 N82-13530 16 matter 17 N82-13578 18 N82-13578 19 For Coal 17 N82-15165 10 US 18 Solar Cells 19 A82-11185 19 Solar 19 Solar Cells 19 Solar 19 Solar Cells 19 Solar 19 Solar Cells 20 Solar 21 N82-12821 22 N82-13200	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RF-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powent and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicat from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Modular isotopic thermoelectric gen	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences p0029 N82-14910 erator p0122 A82-11753 stems - systems program
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p000 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia [OUALITY CONTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 [QUALITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] [QUANTUM EFFICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascad cells - An overview p006 ZnO - p-InP heterojunction solar cells Thin-film gallium arsenide homojunction s p009 QUENCHING (ATOMIC PHYSICS) Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells	06 N82-12196 11 N82-13196 15 N82-13530 15 matter 16 shales of 13 N82-13578 16 for 16 N82-10534 17 N82-15165 10 us 17 N82-15165 10 us 17 N82-11185 10 solar cells 17 N82-11794 17 N82-12821 1851 N82-12821 1852 N82-13200 1842 N82-13200	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RP-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powe and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicat from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Hodular isotopic thermoelectric gen	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences us p0029 N82-14910 erator p0122 A82-11753 stems -
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000244] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian southern West Virginia [OUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 [DE81-030310] p006 [QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p010 [QUANTUM RPFICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascad cells - An overview p006 ZnO - p-InP heterojunction solar cells Thin-film gailium arsenide homojunction s p009 [QUENCHING (ATOMIC PHYSICS)] Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells p006 [QUINOLINB] Enthalpy measurement of coal-derived liquals are senticed and complete senting pooled and cells [D006] [D	06 N82-12196 11 N82-13196 15 N82-13530 15 matter 16 shales of 13 N82-13578 16 for 16 N82-10534 17 N82-15165 10 us 17 N82-15165 10 us 17 N82-11185 10 solar cells 17 N82-11794 17 N82-12821 1851 N82-12821 1852 N82-13200 1842 N82-13200	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RP-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powe and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicat from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Hodular isotopic thermoelectric gen Buclear electric power for space sy Technology background and flight RAIL TRANSPORTATION Controlled velocity testing of smal	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences us p0029 N82-14910 erator p0122 A82-11753 stems - systems program p0123 A82-11756 l wind energy
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p016 Q QUALITY COBTROL Standards application and development plate solar thermal technologies [DE81-030310] p006 QUANTITATIVE ABALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p017 QUANTUM EPPICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascade cells - An overview ZnO - p-InP heterojunction solar cells p007 Thin-film gallium arsenide homojunction s p008 QUENCHING (ATOMIC PHYSICS) Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells p008 QUINOLINB Enthalpy measurement of coal-derived lique (DE81-029481)	26 N82-12196 21 N82-13196 25 N82-13530 25 matter 25 shales of 21 N82-13578 25 N82-13578 26 N82-10534 27 N82-15165 26 N82-11185 27 N82-11185 28 N82-11185 29 N82-11185 20 N82-1185 20 N82-1185 20 N82-1185 21 N82-12821 22 N82-13200 23 N82-13200 24 N82-13200 24 N82-11187 24 N82-11187	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powent and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicates from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Modular isotopic thermoelectric gen Nuclear electric power for space sy Technology background and flight	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 M82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 M82-12924 consequences p0029 M82-14910 erator p0122 A82-11753 stems program p0123 A82-11756 l wind energy n of a technique
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p010 QUALITY COBTROL Standards application and development pla solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p010 QUANTUM RPFICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p000 The development of high efficiency cascad cells - An overview p000 ZnO - p-InP heterojunction solar cells p000 Thin-film gallium arsenide homojunction s p000 QUENCHING (ATOMIC PHYSICS) Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells	26 N82-12196 21 N82-13196 25 N82-13530 25 matter 25 shales of 21 N82-13578 25 N82-13578 26 N82-10534 27 N82-15165 26 N82-11185 27 N82-11185 28 N82-11185 29 N82-11185 20 N82-1185 20 N82-1185 20 N82-1185 21 N82-12821 22 N82-13200 23 N82-13200 24 N82-13200 24 N82-11187 24 N82-11187	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RF-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powent and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicat from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Modular isotopic thermoelectric gen Suclear electric power for space sy Technology background and flight RALL TRANSPORTATION Controlled velocity testing of smal	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 M82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 M82-12924 consequences us p0029 M82-14910 erator p0122 A82-11753 stems - systems program p0123 A82-11756 l wind energy n of a technique p0134 A82-17642
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p000 Pyrolytic characterization of the organic in selected coals and in the Devonian's southern West Virginia p010 QUALITY COMTROL Standards application and development plat solar thermal technologies [DE81-030310] p006 QUANTITATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p010 QUANTUM EFFICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier's p000 The development of high efficiency cascad cells - An overview 2n0 - p-InP heterojunction solar cells Thin-film gailium arsenide homojunction s p000 QUENCHING (ATOMIC PHYSICS) Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells QUINOLINE Enthalpy measurement of coal-derived lique (DE81-029481)	26 N82-12196 21 N82-13196 25 N82-13530 25 matter 25 shales of 21 N82-13578 25 N82-13578 26 N82-10534 27 N82-15165 26 N82-11185 27 N82-11185 28 N82-11185 29 N82-11185 20 N82-1185 20 N82-1185 20 N82-1185 21 N82-12821 22 N82-13200 23 N82-13200 24 N82-13200 24 N82-11187 24 N82-11187	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO PREQUENCY HEATING RP-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave power and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicat from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Modular isotopic thermoelectric gen Nuclear electric power for space sy Technology background and flight RALL TRANSPORTATION Controlled velocity testing of smal conversion systems - An evaluatio	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences us p0029 N82-14910 erator p0122 A82-11753 stems - systems program p0123 A82-11756 l wind energy n of a technique p0134 A82-17642 nsport systems
[DE82-000251] p016 Controlled-flash pyrolysis [DE82-000284] p017 Solar-central-receiver fuels and chemical [DE82-000941] p007 Pyrolytic characterization of the organic in selected coals and in the Devonian s southern West Virginia p016 Q QUALITY COBTROL Standards application and development plate solar thermal technologies [DE81-030310] p006 QUANTITATIVE ABALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p017 QUANTUM EPPICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p006 The development of high efficiency cascade cells - An overview ZnO - p-InP heterojunction solar cells p007 Thin-film gallium arsenide homojunction s p008 QUENCHING (ATOMIC PHYSICS) Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells p008 QUINOLINB Enthalpy measurement of coal-derived lique (DE81-029481)	26 N82-12196 21 N82-13196 25 N82-13530 25 matter 25 shales of 21 N82-13578 25 N82-13578 26 N82-10534 27 N82-15165 26 N82-11185 27 N82-11185 28 N82-11185 29 N82-11185 20 N82-1185 20 N82-1185 20 N82-1185 21 N82-12821 25 N82-13200 26 N82-13200 27 N82-13200 28 N82-13200 28 N82-13200 28 N82-13200 28 N82-13200	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RF-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powent and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicat from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Modular isotopic thermoelectric gen Suclear electric power for space sy Technology background and flight RALL TRANSPORTATION Controlled velocity testing of smal	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences p0122 A82-11753 stems - systems program p0123 A82-11756 l wind energy n of a technique p0134 A82-17642 nsport systems p0146 R82-12520
[DE82-000251] p010 Controlled-flash pyrolysis [DE82-000284] p011 Solar-central-receiver fuels and chemical [DE82-000941] p000 Pyrolytic characterization of the organic in selected coals and in the Devonian southern West Virginia QUALITY COMTROL Standards application and development pla solar thermal technologies [DE81-030310] p000 QUANTIATIVE ANALYSIS Vaporization and chemical transport under gasification conditions [PB81-245839] p010 QUANTUM EPPICIENCY Carrier-collection efficiencies in amorph hydrogenated silicon Schottky-barrier s p000 The development of high efficiency cascad cells - An overview Zno - p-InP heterojunction solar cells p000 Thin-film gallium arsenide homojunction s p000 QUENCHING (ATOMIC PHYSICS) Infrared quenching of photocapacitance in Cu/x/s/CdS solar cells QUINOLINE Enthalpy measurement of coal-derived liqu [DE81-029481] RADIANT PLUX DENSITY Ionospheric power beam studies	26 N82-12196 21 N82-13196 25 N82-13530 25 matter 25 shales of 21 N82-13578 25 N82-13578 26 N82-10534 27 N82-15165 26 N82-11185 27 N82-11185 28 N82-11185 29 N82-11185 20 N82-1185 20 N82-1185 20 N82-1185 21 N82-12821 25 N82-13200 26 N82-13200 27 N82-13200 28 N82-13200 28 N82-13200 28 N82-13200 28 N82-13200	Correlation between results of zone experiment in radiative heat trans [ASME PAPER 81-HT-71] Calculation of the top loss coeffic network method and applications to collectors RADIO FREQUENCY HEATING RP-driven Tokamak reactor with sub- thermally stable operation [DE81-029437] RADIO RECEPTION Solar power satellite microwave powe and reception system RADIOACTIVE ISOTOPES Engineering development testing of converter General Purpose Heat Source-Radioisotope Thermoelectric Galileo orbiter power supply RADIOACTIVE WASTES Low-level radioactive waste: An in overview [DE81-026334] Comparison of potential radiologicat from a spent-fuel repository vers natural-uranium deposits [DE81-028232] RADIOISOTOPE BATTERIES Modular isotopic thermoelectric gen Nuclear electric power for space sy Technology background and flight RALL TRANSPORTATION Controlled velocity testing of smal conversion systems - An evaluatio Evaluation of novel underground tra [DE81-030279]	method and sfer p0121 A82-10958 ient by the o solar p0056 A82-15653 ignited, p0139 N82-11935 er transmission p0145 A82-11743 the GPHS-RTG t Generator for p0122 A82-11752 troductory p0022 N82-12924 consequences p0122 A82-11753 stems - systems program p0123 A82-11756 l wind energy n of a technique p0134 A82-17642 nsport systems p0146 R82-12520

RAILGUN ACCELERATORS	BRACTOR DESIGN
Possible application of electromagnetic guns to	A compact, efficient thermoelectric module for a
impact fusion	space reactor
p0135 A82-18201	p0122 A82-11749 Nuclear reactor closed Brayton cycle space power
A review of rain erosion problems for aerogenerators	conversion systems
p0130 A82-14356	p0126 A82-11840
RAIH IMPACT DAMAGE	An overview of peat qasification
A review of rain erosion problems for aerogenerators	p0089 A82-11848
p0130 A82-14356	Possible application of electromagnetic guns to
RANKINE CYCLE	impact fusion
The economic implications of the exergy and	p0135 A82-18201
thermal efficiencies of energy conversion systems	Particulate processes in pulverized-coal flames
p0121 A82-11702	[DE81-025153] p0093 N82-10157
Development of a solar receiver for an organic	H-coal process improvement study. Bench unit
Rankine cycle engine	baseline run with preheater/reactor
p0048 A82-11800	[DE81-026022] p0094 N82-10260
Organic fluids for the practical use in energy	Advanced-gasification processes
conversion systems of sclar power plants	[DE81-030184] p0102 N82-11254
[BHFT-FB-T-81-154] p0080 N82-15537	Engineering challenges of fusion-reactor development
Overview of active solar absorption/Rankine	[DE81-024129] p0139 N82-11907
cooling program	REACTOR MATERIALS
[DE81-028041] p0082 N82-15577	Materials science issues encountered during the
RATINGS	development of thermochemical concepts in
Performance testing and rating standards for Wind	screening of reactions for solar energy
Energy Conversion Systems	applications
p0135 A82-17646	p0038 A82-10021
REACTION KINETICS	Advanced high temperature thermoelectrics for
Hydrogen generation by means of catalyzed Mg-Al	space power .
`hydrolysis	p0125 A82-11823
p0083 A82-10398	Technology of controlled nuclear fusion
Improved efficiency in the sulfur dioxide - Iodine	[DE81-027361] p0144 N82-15893
hydrogen cycle through the use of magnesium oxide	REAL TIME OPERATION
p0083 A82-11784	Real-time coarse-particle mass measurements in a
Parametric study of the cadmium	high-temperature/pressure coal-gasifier process
thermoelectrochemical hydrogen cycle	treatment
p0083 A82-11785	· [DE81-030039] p0119 N82-15604
The corrosion of some superalloys in contact with	RECEIVERS
coal chars in goal gasifier atmospheres	Technological activities for high performance
p0091 A82-17974	receivers for solar thermal power plants
Design of a cell for electrode kinetic	[BMFT-FB-T-80-133] p0066 N82-10571 RECHARGING
investigations of fuel cell reactions p0136 A82-18394	Rechargeable metallic hydrides for hydrogen storage
Kinetics and mechanisms of catalytic	p0085 A82-17150
hydroliquefaction and hydrogasification of lignite	Rechargeable molten-salt cells
[DE81-023581] p0092 N82-10144	[DE81-027091] p0158 N82-11595
Synthetic-fuel combustion; pollutant formation.	Energy storage systems for terrestrial solar
Soot-initiation mechanisms in burning aromatics	generators cadmium/mercury oxide cells
[DE81-029480] p0093 N82-10155	[BMPT-FE-T-81-082] p0080 N82-15529
Pulverized-fuel combustion: Modeling and scaleup	RECTANGULAR PLATES
methodologies	Optimization of flow passage geometry for
[DE81-026546] p0093 N82-10158	air-heating, plate-type solar collectors
Selectivity in Pischer-Tropsch synthesis: Review	p0055 A82-14846
and recommendations for further work	RECTENNAS
[PB81-223596] - p0095 N82-10271	Design and breadboard evaluation of the SPS
Kinetics and catalysis of producing synthetic	reference phase control system concept
gases from biomass	p0072 N82-12545
[PB81-217614] p0095 N82-10272	The history of the development of the rectenna
Laboratory study for removal of organic sulfur	p0149 N82+12560
from coal	Rectenna system design
[DE81-025132] p0010 N82-11239	p0149 N82-12561
Kinetics of NO/ sub x formation during early	Rectenna session: Micro aspects
stages of pulverized-coal combustion	p0149 N82-12562
[DE81-029071] p0014 N82-11641	A theoretical study of microwave beam absorption
Solid-solid reactions in coal conversion processes p0107 N82-12238	by a rectenna p0149 N82-12563
Development of hydroconversion of bicmass to	Rectenna array measurement results
synthetic fuels	p0149 N82-12564
[DE81-030954] p0108 N82-12260	Session on solid state: Introduction
Kinetics of wet oxidation of biological sludges	p0149 N82-12565
from coal-conversion wastewater treatment	Solid-state retrodirective phased array concepts
[DE82-000525] p0021 N82-12674	for microwave power transmission from Solar
Kinetics of reactions in a wet flue gas	Power Satellite
simultaneous desulfurization and denitrification	p0149 N82-12568
system	RECTIFICATION
[DE81-029853] p0033 N82-15607	Thermoelectric conversions based on noise
REACTION PRODUCTS	rectification
Solid-solid reactions in coal conversion processes	p0138 N82-10936
p0107 N82-12238	RECYCLING
Process for removing sulfur oxides from gases with	SOL-CYCLE: A solar-assisted solvent-recycling
direct production of a usable finished reaction.	process for asphalt-impregnation of fiber board
product ammonium sulfate fertilizer	[DE81-903377] p0070 N82-11615
[BMFT-FB-T-81-102] p0029 N82-15142	Construction of a recycled Portland cement
REACTOR CORES	concrete pavement Connecticut expressway
Development of space reactor core heat pipes p0122 A82-11747	[PB81-233553] p0023 N82-13267 REDOX CELLS
PU122 A02-11/4/	Performance of advanced chromium electrodes for
	the NASA Redox Energy Storage System
	[NASA-TH-82724] p0159 N82-12574
	po 100 moz. 12014

REDUCTION (CHEMISTRY)	REGIONAL PLANNING
Development of a process for recovery of valuable	National coal-market conditions for the year 2000:
components from complex hydrodesulfurization	Regional-issue identification and analysis, high scenario
catalysts especially tungsten, mclybdenum, vanadium, nickel and cobalt	[DE81-026425] p0016 N82-11988
[BMFT-PB-T-80-186] p0016 882-12204	Projecting regional potentials for cost-effective
Thermochemical production of liquids from biomass	energy conservation and renewable resource
[DE81-030085] p0117 W82-15226	applications: A feasibility study [DOE/CS-10045/T3] p0027 N82-14645
Kinetics of reactions in a wet flue gas simultaneous desulfurization and denitrification	[DOE/CS-10045/T3] p0027 N82-14645 Energy and development in Central America. Volume
system	1: Regional assessment
[DE81-029853] p0033 %82-15607	[PB81-231540] p0032 N82-15589
EEFINING Sulfur pollution control. Phase 1: The disposal	REGULATIONS Montana geothernal handbook: A quide to agencies,
program (sections 5 through 7)	regulations, permits and financial aids for
[PB81-222804] p0015 N82-11655	geothermal development
Solvent-Refined Coal (SRC) process	[DE81-024315] p0007 N82-10562
[DE81-031937] p0106 N82-12197 Peasibility study report for the Imperial Valley	Environmental compliance program handbook [DE81-030226] p0008 882-10585
Ethanol Refinery: A	Methodology for determining the impact of
14.9-million-gallon-per-year ethanol synfuel	environmental regulatory programs
refinery utilizing geothermal energy	[DB81-903429] p0009 N82-10594
[DE82-000288] p0112 N82-13252 REPLECTABLE	Relaxing environmental standards during oil-supply disruptions: Past, present and future
Investigation of abrasive action of atmospheric	[DE81-024250] p0009 N82-10601
particles on the reflectance of mirrors	Photovoltaic market analysis program: Background,
p0040 A82-10388 Efficiency of Fresnel lenses	model development, applications and extensions [DE81-029711] p0073 N82-12609
p0043 A82-11387	Millions wasted trying to develop major energy
Optimization of heat losses in normal and reverse	information system
flat-plate collector configurations - Analysis	[APHD-81-40] p0029 N82-14959
and performance p0059 A82-16744	Proceedings: Symposium on Flue Gas Desulfurization, volume 2
REFLECTORS	[PB81-243164] p0035 N82-15652
Contributions of space reflector technology to	REINFORCED SHELLS
food production, local weather manipulation and energy supply, 1985-2020	Optimum reinforcement shapes and paths for rotating composite shells
p0054 A82-14445	p0154 A82-14513
REFRACTORY MATERIALS	REINFORCING MATERIALS
Energy and ceramics Book p0005 A82-17076	Conceptual design of a glass-reinforced concrete
Materials technology for coal-conversion processes	solar collector [DE81-029280] p0065 N82-10542
[DE81-028474] p0100 N82-11169	RELIABILITY
REFRIGERANTS	Project for reliability fleet testing of
A novel latent heat storage for solar space heating systems - Refrigerant storage	alcohol/gasoline blends [DE82-000004] p0107 N82-12250
p0043 A82-11386	RELIABILITY ANALYSIS
REFRIGERATING	Incorporation and impact of a wind energy
Design and development of a reciprocating Low-temperature freon expander	conversion system in generation expansion planning p0004 A82-15068
[DB81-0286C9] p0023 N82-13392	Enertech High Reliability prototype vibration
REPRIGERATING MACHINERY	analysis
Method for calculating the unsteady temperature conditions of the generator in a solar	p0133 A82-17635 Development of high-performance, high-reliability
refrigeration system	windpower generators
p0056 A82-15642	p0134 A82-17640
Design and development of a reciprocating low-temperature freon expander	Photovoltaic systems performance experience [DE81-025725] p0079 N82-14656
[DE81-028609] p0023 N82-13392	RELIABILITY ENGINEERING
BEFRIGERATORS	Distributed photovoltaic systems: Utility
A thermoelectric refrigerator powered by photovoltaic solar collectors	<pre>interface issues and their present status [NASA-CR-165019]</pre>
p0049 A82-11858	REMOVAL
Appliance efficiency and the solar building	Separation of particles from coal derived liquids
[DE81-029073] p0075 N82-13265	Via surface charge properties
REGENERATION (ENGINEERING) Regenerative pyroelectric heat engine	[DE81-029088] p0092 N82-10141 RESEARCH
p0126 A82-11833	Key contributions in MHD power generation
Industrial applications of MHD high temperature	[DE81-028121] p0138 N82-10882
air heater technology [AIAA PAPER 81-2588] p0130 A82-14037	Ames Laboratory research report, 1980 [DE81-027399] p0161 N82-11012
High-temperature counter-flow recuperator	RESEARCE AND DEVELOPMENT
[DE81-031923] p0017 N82-12424	Solar energy technology - A five-year update
Utilization of waste heat from major transformer substations. Volume 1: Generic study	p0044 A82-11541 Pactors in the development of a major US synthetic
[DB81-904212] p0019 N82-12593	fuels industry
Utilization of waste heat from major transformer	p0001 A82-11543
substations. Volume 2: Site-specific study [DE81-904236] p0019 N82-12594	Advances in space power research and technology at the National Aeronautics and Space Administration
REGENERATIVE FORL CELLS	p0122 A82-11755
Development status of a regenerative fuel cell	Gallium arsenide solar cells-status and prospects
system for orbital operation p0153 A82-11707	for use in space p0046 A82-11765
REGENERATORS	
	Advances in photovoltaics R&D - An overview
Rotating regenerative heat exchanger for energy recovery in chemical plants	Advances in photovoltaics RED - An overview p0047 A82-11793 Research activities of solar cells in ROC

Overview of DOE's large stational development program		Annual cycle energy system [DE81-024911]
High-temperature sclar central i	p0123 A82-11805 receivers	Preliminary investigation saving heat supply syste
Solar perspectives - Israel, sol	p0052 A82-12949 lar pond innovator	district "Maria Lindenho Germany using river
An estimate of OTEC costs, marke	p0052 A82-12950	and systems engineering [BMFT-FB-T-80-157]
proof-of-concept vessel finance	ing	Sampling design for the 19
[AIAA PAPER 81-2567] OTEC ocean system development	p0003 A82-14024	multifamily residential [DE81-028783]
[AIAA PAPER 81-2590]	p0130 A82-14038	User needs for solar decis
Renewables in the U.S. energy for how fast	iture - How much,	homebuilding industry [DE81-027293]
0	p0003 A82-14404	Well-water-source heat pum
One viewpoint concerning unit si development of wind turbines	ize in the	[DE81-024136] Solar energy system perform
Research opportunities in new er	p0131 A82-14845 nergy-related	Forest City Dillon, Wash 1980 - December 1980
materials	p0161 A82-15377	[DE81-028174] Solar energy system perfor
Cooperative program of applied e		Montecito Pines, Santa R
technology development [DE81-028916]	p0007 N82-10517	November 1979 - April 19 [DE81-028175]
LLNL 1981: Technical horizons	-	Study of photovoltaic cost
[DE81-028265] Evaluating R and D options under	p0026 N82-14048 uncertainty.	Installation cost model: systems: Users manual
Volume 3: An electric-utility	7	[DE81-031921]
generation-expansion planning [DE81-904237]	p0035 N82-16013	SOLPLAN report: An assess incentives to conservation
Aeronautics and space report of		alternative-energy use i
1980 activities [NASA-TM-84079]	p0035 N82-16022	in Wisconsin [DOE/CS-30292/3]
RESEARCH FACILITIES	******	Solar Heating And Cooling
Dimensions, volume 65, number 3 [PB81-235053]	p0161 N82-15436	Requirements definition Volume 1: Energy-conser
RESEARCH MANAGEMENT	-	residential structures
Environmental research plan for technologies. Volume 2: Envir		[DE82-900206] Solar Heating And Cooling
plan [PB81-222317]	50011 NO2-1127#	Requirements definition
Pulsed Power Research colloquium	p0011 N82-11274	Volume 2: Domestic hot [DE82-900207]
[AD-A105770] RESEARCH PROJECTS	p0150 N82-14638	Solar Heating And Cooling Requirements definition
Research activities of sclar cel		Volume 3: Customer load
RESERVOIRS	p0047 A82-11795	[DE82-900208] Comparison of residential
Planning an underground pumped i		effects of mass and insu
the Commonwealth Edison Compar	p0154 A82-11847	[DE81-027938] Assessment of the potential
Development of man-made geothers	al reservoirs	engines in total and inte
extracting heat from hot dry n [LA-UR-81-852]	p0097 N82-10480	[DE82-000169] Cost goals for a residenti
Feasibility of a small scale pur	iped storage	liquid collector system
demonstration project, Hibbing [DE81-028678]	J, Minnesota p0155 N82-10525	locations [DE81-029700]
Hot dry rock geothermal energy of	levelopment program	Economic implications of page 1
[LA-UR-81-1265] Formation evaluation in liquid-	p0097 N82-10560	for single-family reside: Mexico: A case study
geothermal reservoirs		[DE81-028402]
[DOE/ET-28384/T1] Resource assessment of Low and	p0109 N82-12514	Fuel savings in hot water in application of heat pump.
Moderate-temperature geotherma		gas (natural gas heat pur
Calistoga, Napa County, Califo	p0109 N82-12518	[BMFT-FB-T-80-125] Ultimate in building energi
Reservoir stability studies	-	BLAST
[DE81-030099] RESIDENTIAL ENERGY	p0160 N82-15510	[DL81-028703] Appliance efficiency and to
Alternative power sources for re	esidential	[DE81-029073]
air-conditioning systems	p0039 A82-10331	Annual cycle energy system performance and national
Net energy analysis of small wir		[DE81-028570]
conversion systems	p0121 A82-11389	Data report for the norther experiment station, June
A simplified method for direct of	alculation of the	systems
annual load fraction of solar heating	systems for space	[DE82-000068] Coal-oil mixtures: An alto
	p0054 A82-14405	commercial markets and la
A solar heating system with annu	p0056 182-15666	[DE81-028335] Biomass energy utilization
Wind energy and the Nation's run	al electric systems	Northwest: Impacts asso
Earth shelter 2. 1979-1980 USC	p0091 A82-17645	use of solid fuels [DE81-029137]
[CONF-800438]	p0006 N82-10277	Residential site design and
Solar project description for li		Part 1: General report

single family residence, Davis, California

Summary of passive-solar-retrofit workshops [DE81-028146] p0065 h

p0064 N82-10511

p0065 N82-10547

[DE81-029743]

```
p0007 N82-10552
                 estigation on a primary energy
upply system for the residential
ia Lindenhof" in Dorsten, West
                 sing river water as a heat source
                 ngineering
                                           p0008 N82-10572
                  for the 1980 commercial and
                 esidential building survey
                                          p0011 N82-11320
                 solar decision-making tools: The
                 industry
                                           p0067 N82-11325
                 ce heat pump field performance study
                                          p0012 N82-11419
                 stem performance evaluation:
                 Dillon, Washington, D.C., January
per 1980
                                          p0068 N82-11560
                 stem performance evaluation:
                 es, Santa Rosa, California,
                    April 1980
                 p0068 N82-11561 Volume 4. cost model for -
                 cost model for residential PV
                 rs manual
                                           p0069 N82-11568
                   An assessment of barriers and
                  conservation and
                 energy use in the residential sector
                                          p0013 N82-11614
                 nd Cooling Of Buildings (SHACOB):
                 definition and impact analysis-2.
                 ergy-conserving design for
                 tructures
                                          p0017 N82-12278
                 And Cooling Of Buildings (SHACOB):
definition and impact analysis-2.
                 mestic hot water systems
                                          p0071 N82-12279
                 and Cooling Of Buildings (SHACOB):
definition and impact analysis-2.
stomer load management systems
                                          p0071 N82-12280
                 esidential window distributions and
                 ss and insulation
                 p0017 N82-12283
the potential of coal-fueled heat
                 stal and integrated energy systems
                 p0018 N82-12587
a residential photovoltac/thermal
                 tor system set in three northern
                                          p0073 N82-12610
                 ations of passive-solar retrofit
                 mily residences in Albuquerque, New
                                          p0074 N82-12630
                  hot water heating plants by
                 of heat pumps operated with natural gas heat pump). Project: gas engine
                  -125]
                                          p0020 N82-12641
                 lding energy analysis: DOE-2 and
                                          p0023 N82-13263
                 nency and the solar building
                                          p0075 N82-13265
                 ergy system experimental
                 nd national applicability
                                          p0024 N82-13523
                  the northeast residential
                 ation, June 1981 --- photovoltaic
                                          p0077 N82-13533
                 es: An alternative fuel for the
                 rkets and large residential markets
                                          p0114 N82-14379
                 utilization in the Pacific
                 mpacts associated with residential
                                          p0115 N82-14383
                 e design and energy conservation.
  Part 1:
            General report
  [DE81-904010]
                                          p0027 N82-14398
Design of an energy conservation building
 [ NASA-TM-83175]
                                          p0027 N82-14632
```

Solar Photovoltaic Residential Project. Project	Passive-solar-retrofit study for the United States Navy
Integration Meeting, Agenda and Abstracts [DE81-028433] p0079 N82-14657	[DE81-028921] p0074 N82-12629
Potential energy savings in the residential sector	Economic implications of passive-solar retrofit
of the United States	for single-family residences in Albuquerque, New
[DZ81-026873] p0028 N82-14662 Technology change and energy consumption: A	Mexico: A case study [DE81-028402] p0074 N82-12630
comparison of residential subdivisions	Low-cost passive-solar retrofits for new and
[DE81-030075] p0031 N82-15555	existing mobile homes
Incremental cooling load determination for passive	[DE81-028356] p0081 N82-15544
direct gain heating systems [DE81-029882] p0081 N82-15575	REVERSE FIELD PINCH The tilting mode in field-reversed configurations
RESIDUAL STRESS	stability of toroidal plasma equilibria
Residual stresses in darrieus vertical axis wind	p0121 A82-11131
turbine blades [DE81-1026144] p0136 N82-10434	REVERSE OSMOSIS Treatment of biomass gasification wastewaters
RESIDUES	using reverse osmosis
Costs for alternative grain-residue-collection	[DE82-000698] p0025 N82-13566
systems	RHEOLOGY
[DE81-029072] p0110 N82-12633 RESISTANCE HEATING	Study of gelled LNG [DE81-023259] p0095 N82-10269
Baking of carbon anodes for the electrolysis of	Thermophysical properties of coal liquids
aluminum by electric resistance heating	[DE81-0279446] p0097 N82-10938
[BMFT-PB-T-81-168] p0030 N82-15168	H-Coal product physical properties measurement
RESISTORS Two-dimensional effects in power take-off region	[DE81-029095] p0111 N82-13245 Improved polymers for enhanced oil recovery
[DE82-000091] p0141 N82-13367	synthesis and rheology
RESONANT FREQUENCIES	[DE81-030194] p0118 N82-15509
Calculation of natural modes of vibration for rotor blades by the finite element method	RHODE ISLAND
[DFVLR-FB-81-07] p0136 N82-10452	Planning a compremensive program for exploration of the anthracite deposits of the Narragansett
RESOURCE ALLOCATION	Basin of Massachusetts and Rhode Island, phase 1
Maritime support for ocean-resources development	and 2
[AD-A104730] p0111 N82-12735 Natural gas plan needed to provide greater	[DE81-028490] p0104 N82-11519 Exploration of coal and anthracitic carbonaceous
protection for high-priority and critical uses	shale resources, Marragansett Basin,
[PB81-228488] p0023 N82-13255	Massachusetts, and Rhode Island
Role of large scale energy systems models in R&D	[DE81-030895] p0104 N82-11523 RIBBONS
planning [pg81-026058] p0031 N82-15543	A study of the purification process during the
RESOURCES MANAGEMENT	elaboration by electron bombardment of
Montana geothermal handbock: A guide to agencies,	polysilicon ribbons designed for photovoltaic
regulations, permits and financial aids for qeothermal development	conversion p0057 A82-16054
[DE81-024315] p0007 N82-10562	RIPPLES
Energy analysis of human ecosystems in an	Wind ripple analysis
Appalachian coal county [DE81-025177] p0013 N82-11574	[AIAA PAPER 81-2580] p0129 A82-14033 RIVER BASINS
Urban ecosystem and resource-conserving urbanism	Geology of the nahcolite deposits and associated
in Third World cities	oil shales of the Green River Pormation in the
[DE81-029854] p0016 N82-11995 Development of peatlands in northern Minnesota	Piceance Creek Basin, Colorado p0105 N82-11683
[DE82-000873] p0112 N82-13475	RIVERS
RESPIRATION	Preliminary investigation on a primary energy
Low-Btu-gasifier emissions toxicology	saving heat supply system for the residential
[DB81-031000] p0014 M82-11651 Carcinogenic effects of coal-conversion materials	district "Maria Lindenhof" in Dorsten, West Germany using river water as a heat source
[DE81-028108] p0029 N82-14803	and systems engineering
RETORT PROCESSING	[BMFT-FB-T-80-157] p0008 N82-10572
Production of synthetic crude oil from coal using the TOSCOAL pyrolysis process	ROADWAY POWERED VEHICLES Future of electricity for automobiles: Advanced
p0090 A82-11849	electric vehicle concepts
Application of HTGR process heat to oil shale	[DE81-028235] p0029 N82-14987
retorting p0090 A82-11851	ROCK HECHANICS
Investigation of factors affecting the in-situ	Sandia program in geothermal technology development [DE81-025394] p0119 N82-15546
combustion retorting of cil shale	ROCKETS
[DE82-000482] p0106 N82-12200	Solar project description for Public Service
Design and test of two-step solar oil shale retort [DE82-000964] p0077 N82-13543	Company of New Mexico (lot 7) single family residence, Blo Rancho, New Mexico
RETROPITIEG	[DE81-027853] p0063 N82-10509
Problems and potential for MHD retrofit of	ROCKS
existing coal-fired plants [AIAA PAPER 81-2586] p0130 A82-14036	Development of man-made geothermal reservoirs extracting heat from hot dry rock
Summary of passive-solar-retrofit workshops	[LA-UR-81-852] p0097 N82-10480
[DE81-028146] p0065 N82-10547	Hot dry rock geothermal prospects, 1981
An evaluation of three-way control single and dual	[DE81-025305] p0119 N82-15559
<pre>bed catalysts as applied to heavy-duty gasoline engines</pre>	Design study of a continuously variable roller
[PB81-224982] p0012 N82-11477	cone traction CVT for electric vehicles
BPA evaluation of the FUBI-MAX device under	[NASA-CR-159841] p0159 N82-12445
Section 511 of the Motor Vehicle Information and Cost Savings Act	ROTARY WIEG AIRCHAFT The stability of a tethered gyromill
[PB81-229866] p0012 N82-11479	a concret Alremitt
BPA evaluation of the Automotive Cylinder	[AIAA PAPER 81-2569] p0129 A82-14026
	ROTATING BODIES
Deactivator System (ACDS) under Section 511 of	ROTATING BODIES Composite flywheel balance experience
	ROTATING BODIES

Rotating regenerative heat exchanger for energy recovery in chemical plants polo30 N82-15367 ROTATING GENERATORS polo30 N82-15367 ROTATING GENERATORS polo45 Naccatanger from space-based nuclear power stations polo45 N82-11746 Pabrication, testing, and modeling plans for a 125-kW counter-rotating-turbine wave energy converter [DE61-023946] polo73 N82-10559 ROTOR ARROVAMMICS The effect of shielding on the aerodynamic performance of Savonius wind turbines performance of Savonius wind turbines performance and rotor optimization under constant REMOPERATION polo25 N82-14019 Methodology for the evaluation of aerodynamic performance and rotor optimization under constant REMOPERATION polo29 N82-14019 (ALAA PAPER 0-2500) automatic yawing of tro-bladed wind turbines with passive cyclic pitch variation [ALAA PAPER 0-2570] polo29 N82-14021 (Tro-bladed wind turbines with passive cyclic pitch variation [ALAA PAPER 0-2570] polo29 N82-14031 N82-14031 (ALAA PAPER 0-2570] polo29 N82-14031 N82-14034 Naturbines [ALAA PAPER 0-2579] polo29 N82-14031 N82-14034 Naturbines (ALAA PAPER 0-2592) polo30 N82-14034 Naturbines (ALAA PAPER 0-2592) polo30 N82-14034 Naturbines (ALAA PAPER 0-2592) polo30 N82-14034 Naturbines (ALAA PAPER 0-2502) polo30 N82-14034 Naturbines (ALAA PAPER 0-2502) polo30 N82-14034 Naturbines (ALAA PAPER 0-2502) polo30 N82-17643 Naturbines (ALAA PAPER 0-2504) polo30 N82-17642 Polo30 N82-17642 Polo30 N82-17642 Polo30 N82-17642 Polo30 N82-17642 Polo30 N82-17					
ROTATIME GENERATORS Applications of power beaming from space-based nuclear power stations Pabrication, testing, and modeling plans for a 125-kW counter-rotating-turbine wave energy converter [DB81-023946] P0137 M82-10559 ROTOM ARBODYBANICS The effect of shielding on the aerodynamic performance of Savonius wind turbines performance and rotor optimization under constant RFMoperation [AITAM PAPER 81-2560] p0128 A82-14019 Rotor speed control by automatic yaving of two-hladed wind turbines with passive cyclic pitch variation [AITAM PAPER 81-2570] p0129 A82-14027 Up- and down-wind rotor half interference model for VAWT Vertical Axis Wind Turbines [AITAM PAPER 81-2579] Aerodynamic loads and rotor performance for the Darrieus wind turbines [AITAM PAPER 81-2592] p0130 A82-14031 An analytic model of high solidity vertical axis windmills First results from the UMass wind tunnel test program for windpowered generator optimization [D881-030091] German-Argentine experiment: Vertical-rotor wind engine poliah Maper Bal-2560] p0138 N82-11045 ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0134 N82-11045 P0158 AB2-11045 P0158 A	Rotating regenerative heat exchanger	for	eв	ergy	
ROTATIME GENERATORS Applications of power beaming from space-based nuclear power stations Pabrication, testing, and modeling plans for a 125-kW counter-rotating-turbine wave energy converter [DB81-023946] P0137 M82-10559 ROTOM ARBODYBANICS The effect of shielding on the aerodynamic performance of Savonius wind turbines performance and rotor optimization under constant RFMoperation [AITAM PAPER 81-2560] p0128 A82-14019 Rotor speed control by automatic yaving of two-hladed wind turbines with passive cyclic pitch variation [AITAM PAPER 81-2570] p0129 A82-14027 Up- and down-wind rotor half interference model for VAWT Vertical Axis Wind Turbines [AITAM PAPER 81-2579] Aerodynamic loads and rotor performance for the Darrieus wind turbines [AITAM PAPER 81-2592] p0130 A82-14031 An analytic model of high solidity vertical axis windmills First results from the UMass wind tunnel test program for windpowered generator optimization [D881-030091] German-Argentine experiment: Vertical-rotor wind engine poliah Maper Bal-2560] p0138 N82-11045 ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0134 N82-11045 P0158 AB2-11045 P0158 A	recovery in chemical plants				
ROTATING SERERATORS Applications of power beaming from space—based nuclear power stations Pabrication, testing, and modeling plans for a 125-48 Counter-rotating-turbine wave energy converter [D81-023946] p0137 M82-10559 ROTOR ARRODYNAMICS The effect of shielding on the aerodynamic performance of Savonius wind turbines performance of Savonius wind turbines performance and rotor optimization under constant RFMoperation [AIAN PAPER 81-2560] p0128 M82-14019 Rotor speed control by automatic yawing of two-haded wind turbines with passive cyclic pitch variation [AIAN PAPER 81-2570] p0129 M82-14027 Up- and down-wind rotor half interference model for VMW7 Vertical Axis Wind Turbines [AIAN PAPER 81-2579] p0129 M82-14031 Alerodynamic loads and rotor performance for the Darrieus wind turbines [AIAN PAPER 81-2592] p0130 M82-14034 An analytic model of high solidity vertical axis windsills First results from the UMass wind tunnel test program for windpowered generator optimization [D831-03009] German-Argentine experiment: Vertical-rotor wind variation [D831-03009] German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade deesign ROTOR BLADES (TURBOMACHIBERY) Rethodology for the evaluation of aerodynamic performance and rotor optimization under constant RFMoperation [MAS-TH-62594] p0128 M82-11045 ROTOR SLADES (TURBOMACHIBERY) Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAN PAPER 81-2500] p0129 M82-10631 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows P0125 M82-11061 ROTORS SPEED Performance of a small low speed Darrieus type rotor in shear flows P0127 M82-1063 ROTOR SPEED Performance of a small low speed Darrieus type rotor the shear flows P0129 M82-17643 ROTOR SPEED Performance of a small low speed Darrieus type rotor in shear flows P0130 M82-17642 ROTORIES THE COMPUTERS) Theoretical basis of the D02-2 building energy use ana		D003	30	N82-	15367
Applications of power beaming from space-based nuclear power stations Pabrication, testing, and modeling plans for a 125-kW counter-rotating-turbine wave energy converter [D881-023946] p0137 N82-10559 BOTOB ABBODYBANICS The effect of shielding on the aerodynamic performance of Savonius wind turbines performance and rotor optimization under constant RFMOperation [AITAN PAPER 81-2560] p0128 A82-14019 Rotor speed control by automatic yawing of two-hladed wind turbines with passive cyclic pitch variation [AITAN PAPER 81-2570] p0129 A82-14027 UP- and down-wind rotor half interference model for VAWY Vertical Axis Wind Turbines [AITAN PAPER 81-2579] p0129 A82-14031 An analytic model of high solidity vertical axis windmills First results from the UMass wind tunnel test program for windprowered generator optimization windmills First results from the UMass wind tunnel test program for windprowered generator optimization [D881-030091] p0138 A82-11045 Faving of wind turbines with blade cyclic pitch variation [D881-030091] p0138 N82-11045 German-Argentine experiment: Vertical-rotor wind engune polyal APPER 81-2560] p0138 N82-11045 ROTOR BLADES (TURBOHACHIWERY) Rethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMOperation [AITAN PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 ROTOR SPEED ROTO		•			
Pabrication, testing, and modeling plans for a 125-kW counter-rotating-turbine wave energy converter [D881-023946] p0137 N82-10559 ROTOB AEMODYNAMICS The effect of shielding on the aerodynamic performance of Savonius wind turbines performance of Savonius wind turbines performance of Savonius wind turbines performance and rotor optimization under constant RFMoperation [AINA PAPER 81-2560] p0128 A82-14019 Rotor speed control by automatic yawing of two-hladed wind turbines with passive cyclic pitch variation [AINA PAPER 81-2570] p0129 A82-14027 Up- and down-wind rotor half interference model for VAW7 Vertical Axis Wind Turbines [AINA PAPER 81-2579] p0129 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AINA PAPER 81-2592] p0130 A82-14034 An analytic model of high solidity vertical axis windwills picture wind turbines windwills p0131 A82-17643 An analytic model of high solidity vertical axis windwills First results from the UMass wind tumble test program for windpowered generator optimization [D881-030031] p0138 N82-17643 Tawing of wind turbines with blade cyclic pitch variation [D881-030031] p0138 N82-17643 Application of orthotropic plate theory to windmill blade design p0121 A82-10978 Application of orthotropic plate theory to windmill blade design p0121 A82-10978 N80-00019 For the evaluation of aerodynamic performance and rotor optimization under constant RFMoperation p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 ROTOR BLADES (TUBBOMACHIMERY) ROTOR BLADES (TUBBOMACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RFMoperation p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 ROTOR SPEED p0136 A82-18250] p0138 A82-18250 p0133 A82-17631 ROTOR SPEED p0136 A82-18250 p0134 A82-18250 p0134 A82-18250 p0134 A82-18250 p0134 A82-18250 p0134 A82-18250 p0135 A82-18250 p0136 A82-18250 p0136 A82-18250 p0136 A82-	Applications of power beaming from s	12.00	-ha	502	
Pabrication, testing, and modeling plans for a 125-kW counter-rotating-turbine wave energy converter [D881-023946] p0137 N82-10559 ROTOR ARBOTVANAICS The effect of shielding on the aerodynamic performance of Savonius wind turbines pol25 N82-11826 Methodology for the evaluation of aerodynamic performance and rotor optimization under constant REMOBERATION [D88-2-14019] Rotor speed control by automatic yaving of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2550] p0128 N82-14027 Up- and down-wind rotor half interference model for VAWI Vertical Axis Wind lurbines [AIAA PAPER 81-2579] p0129 N82-14027 Up- and down-wind rotor performance for the Darrieus wind turbines [AIAA PAPER 81-2579] p0129 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIAA PAPER 81-2592] p0130 A82-14034 An analytic model of high solidity vertical axis windmills First results from the UMass wind tunnel test program for windpowered generator optimization [D881-030091] German-Argentine experiment: Vertical-rotor wind variation [D881-030091] German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOMACHIMERY) RECTOR SPEED Performance and rotor optimization under constant RPHOBERTATION pol133 A82-14039 Lightning protection for composite rotor blades of windpowered turbines P0133 A82-17631 P0133 A82-14633 P0134 N82-14633 P0135 N82-11095 P0136 A82-18097 P0137 N82-18097 P0137 N82-18097 P0137 N82-18097 P0137 N82-18097 P0137 N82-18097 P0137 N82-18097 P0138	nuclear never stations	,			
Pabrication, testing, and modeling plans for a 125-4% counter-rotating-turbine wave energy converter [D881-023946] p0137 M82-10559 MOTOR ARBODYNAMICS The effect of shielding on the aerodynamic performance of Savonius wind turbines performance of Savonius wind turbines performance and rotor optimization under constant RFMoperation [AITAN PAPER 81-2560] p0128 M82-14019 Mtor speed control by automatic yawing of two-hladed wind turbines with passive cyclic pitch variation [AITAN PAPER 81-2570] p0129 M82-14027 Up- and down-wind rotor half interference model for VM97vertical Mins Wind Turbines [AITAN PAPER 81-2579] p0129 M82-14031 Merchanic for VM97vertical Mins Wind Turbines [AITAN PAPER 81-2579] p0130 M82-14034 Maralytic model of high solidity vertical axis windwills Pare wind turbines with blade cyclic pitch warriation policy wind turbines windwills Pirst results from the UMass wind tumnel test program for windpowered generator optimization windwills Pirst results from the UMass wind tumnel test program for windpowered generator optimization warriation [D801-030091] p0138 M82-17643 Yawing of wind turbines with blade cyclic pitch variation p0134 M82-17643 Pare p1030091] p0138 M82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 M82-12648 MOTOR BLADES Application of orthotropic plate theory to windmill blade design p0121 M82-10978 MOTOR BLADES (TURBOMACHIBERY) Rethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMOperation [AITA PAPER 81-2560] p0128 M82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 M82-17631 MOTOR BLADES (TURBOMACHIBERY) Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AITA PAPER 81-2570] p0129 M82-14633 MOTOR SPEED Porformance testing of a Savonius windmill rotor in shear flows P0134 M82-17632 ROTORS Performance of a small low speed Darrieus type rotor p0136 M82-18328 P018 Hameleney and the Nation's rural electric systems p0091	undient boset practous	D01/	15	102	11786
125-kW counter-rotating-turbine wave energy converter [D881-023946] p0137 N82-10559 ROTOR ABBOTVENNICS The effect of shielding on the aerodynamic performance of Savonius wind turbines p0125 A82-11826 Pethodology for the evaluation of aerodynamic performance and rotor optimization under constant RFMoperation [AITAN PAPER 81-2560] p0128 A82-14019 Rotor speed control by automatic yaving of two-bladed wind turbines with passive cyclic pitch variation [AITAN PAPER 81-2570] p0129 A82-14027 Up- and down-wind rotor half interference model for VAWI Vertical Axis Wind Turbines [AITAN PAPER 81-2579] p0129 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AITAN PAPER 81-2579] p0130 A82-14034 An analytic model of high solidity vertical axis windialls Pirst results from the UMass wind tunnel test program for windpowered generator optimization [D881-030091] German-Argentine experiment: Vertical-rotor wind variation [D881-030091] German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 Application of orthotropic plate theory to windmill blade deesign p0121 A82-14019 Lightning protection for composite rotor blades of windpowered turbines performance and rotor optimization under constant RPMOperation [AITAN PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Alumnum blade development for the Mod-OA 200-kilowatt wind turbines with passive cyclic pitch variation [AITAN PAPER 81-2550] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 A82-18633 P0138 A82-1	Makedanakian kanking and madaling w				11740
CONVERTED [D80-023946] p0137 M82-10559 BOTOR ARBODYNAMICS The effect of shielding on the aerodynamic performance of Savonius wind turbines po10125 M82-11826 Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RFMoperation [AIAM PAPES 81-2500] p0128 M82-14019 Rotor speed control by automatic yaving of two-bladed wind turbines with passive cyclic pitch variation [AIAM PAPES 81-2570] p0129 M82-14027 UP- and down-wind rotor half interference model for VMW1 Vertical Axis Wind Jutbines [AIAM PAPES 81-2579] p0129 M82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIAM PAPES 81-2592] p0130 M82-14031 An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tumnel test program for windpowered generator optimization p0134 M82-17643 Yaving of wind turbines with blade cyclic pitch variation [D881-030091] p0138 M82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 M82-12648 BOTOR BLADES Application of orthotropic plate theory to windmill blade design BOTOR BLADES (TURBOMACHIBERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPHOperation [AIAM PAPES 81-2500] p0128 M82-14019 Lightning protection for composite rotor blades of windpowered turbines Aluminum blade development for the Mod-oh 200-kilowatt wind turbines with passive cyclic pitch variation [AIAM PAPES 81-2570] p0128 M82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows ROTOR SPEED Performance of a small low speed Darrieus type rotor p0134 M82-17631 ROTOR SPEED Performance of a small low speed Darrieus type rotor p0134 M82-17632 ROTOR SPEED Performance of a small low speed Darrieus type rotor p0134 M82-17632 BOTOR SPEED Performance of a small low speed Darrieus type rotor p0134 M82-17642 PO138 M82-11380 ROTOR SPEED Performance of a small					
[DE81-023946] p0137 M82-10559 ROTOR REMODYNAMICS The effect of shielding on the aerodynamic performance of Savonius wind turbines performance of Savonius wind turbines performance and rotor optimization under constant RPHoperation p0125 A82-11826 Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPHoperation p0128 A82-14019 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AITAM PAPER 81-2570] p0129 A82-14027 Up- and down-wind rotor half interference model for VAWT Vertical Axis Wind Turbines [AITAM PAPER 81-2579] p0129 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AITAM PAPER 81-2582] p0130 A82-14034 An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] p0138 M82-11045 German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBORACHIMENY) Rethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AITAM PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines P0133 A82-17631 Aluminum blade development for the Mod-OA 200-xilowatt wind turbine p0143 M82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows P0133 A82-17631 ROTOR SPEED Performance of a small low speed Darrieus type rotor in shear flows P0134 A82-17642 ROTOR SPEED Performance of a small low speed Darrieus type rotor p136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p136 A82-18328 Performance of a small low speed Darrieus type rotor p136 A82-18328 Find energy and the Nation's rural electric systems p1096 A82-18328 Forestical basis of the D0E-2 building energy use analy		se er	ier	ďλ	
ROTOR ARRODYNAMICS The effect of shielding on the aerodynamic performance of Savonius wind turbines pol125 A82-11826 Bethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AITA PAPES 81-2560] pol128 A82-14019 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AITA PAPES 81-2570] pol129 A82-14027 UP- and down-wind rotor half interference model for VAWT Vertical Axis Find Turbines [AITA PAPES 81-2570] pol129 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AITA PAPES 81-2579] pol129 A82-14034 An enalytic model of high solidity vertical axis windmills First results from the UMass wind tunnel test program for windpowered generator optimization pol134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DR81-030091] pol38 N82-11045 German-Argentine experiment: Vertical-rotor wind engine pol441 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design pol24 A82-10978 ROTOR BLADES (FURBORACHIBER) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AITA PAPES 81-2560] pol28 A82-14019 Lightning protection for composite rotor blades of windpowered turbines pol33 A82-14633 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [MASA-TH-82594] pol143 A82-14031 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows pol26 A82-14027 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Pol34 A82-17642 ROTORS ROTORS Performance of a small low speed Darrieus type rotor pol36 A82-1828 ROTORS ROTORS Performance of a small low speed Darrieus type rotor pol36 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor pol36 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor pol36 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor pol36 A82-17642					
The effect of shielding on the aerodynamic performance of Savonius wind turbines pol25 Ad2-11826 Bethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPEB 81-2560] pol28 A82-14019 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPEB 81-2570] pol29 A82-14027 Up- and down-wind rotor half interference model for VAWT Vertical Axis Wind Turbines [AIAA PAPEB 81-2579] pol29 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIAA PAPEB 81-2582] pol30 A82-14034 An analytic model of high solidity vertical axis windmills First results from the UMass wind tunnel test program for windpowered generator optimization pol34 A62-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] pol38 M82-11045 German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBORACHIMENY) Bethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPEB 81-2560] pol28 A82-14019 Lightning protection for composite rotor blades of windpowered turbines Alumnum blade development for the Mod-OA 200-kilowatt wind turbine pol43 M82-17631 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Pol33 A82-17631 ROTOR SPEED Performance of a small low speed Darrieus type rotor in shear flows Pol36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol36 A82-18328 Wind energy and the Nation's rural electric systems pol36 A82-18328 Wind energy and the Nation's rural electric systems pol36 A82-18328 Foretical basis of the DoE-2 building energy use analysis program [DE81-029614] pol38 M82-11380 BURLA LARES Wind energy and the Nation's rural electric systems pol36 A82-18328 Find energy and the Sation's rural electric systems pol36 A82-18328 Foretical basis of	[DB81-023946]	p01.	37	N82-	10559
Performance of Savonius wind turbines p0125 A82-11826 Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAM PAPEB 81-2560] p0128 A82-14019 Rotor speed control by automatic yaving of two-bladed wind turbines with passive cyclic pitch variation [AIAM PAPEB 81-2570] p0129 A82-14027 UP- and down-wind rotor half interference model for VANT Vertical Axis Wind Turbines [AIAM PAPEB 81-2579] p0129 A82-14031 Are Paper 81-2559] p0129 A82-14034 An analytic model of high solidity vertical axis windmills Possible Program for windpowered generator optimization p0134 A82-17643 First results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DEB1-030091] German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0121 A82-10978 ROTOR BLADES (TURBORACHIMEN) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAM PAPEB 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines P0131 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [MAS-TM-82594] p0143 N82-11631 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique policy A82-17602 ROTORS ROTOR SPEED Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTOR SPEED Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTOR SPEED Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTOR SPEED Postor development of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a majo	ROTOR ABRODYNAMICS				
Performance of Savonius wind turbines p0125 A82-11826 Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAM PAPEB 81-2560] p0128 A82-14019 Rotor speed control by automatic yaving of two-bladed wind turbines with passive cyclic pitch variation [AIAM PAPEB 81-2570] p0129 A82-14027 UP- and down-wind rotor half interference model for VANT Vertical Axis Wind Turbines [AIAM PAPEB 81-2579] p0129 A82-14031 Are Paper 81-2559] p0129 A82-14034 An analytic model of high solidity vertical axis windmills Possible Program for windpowered generator optimization p0134 A82-17643 First results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DEB1-030091] German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0121 A82-10978 ROTOR BLADES (TURBORACHIMEN) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAM PAPEB 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines P0131 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [MAS-TM-82594] p0143 N82-11631 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique policy A82-17602 ROTORS ROTOR SPEED Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTOR SPEED Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTOR SPEED Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTOR SPEED Postor development of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a majo	The effect of shielding on the aerody	ynam:	ic		
Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RFMoperation [AIAA PAPER 81-2560] p0128 A82-14019 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Up- and down-wind rotor half interference model for VANT Vertical Axis Wind Turbines [AIAA PAPER 81-2579] p0129 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIAA PAPER 81-2592] p0130 A82-14034 An analytic model of high solidity vertical axis windsills Pirst results from the UMass wind turbel test program for windpowered generator optimization [D881-030091] p0138 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [D881-030091] p0138 N82-11045 German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOBACHIERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines PO133 A82-17631 Alumnum blade development for the Mod-0A 200-kilowatt wind turbine [NASA-TB-82594] p0143 N82-14633 ROTOR SPEED Po1034 A82-17631 AUBINIOUS WARD ARROWS WARD WARD ARROWS	performance of Savonius wind turbin	nes			
Rethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [ATAM PAPER 81-2560] pol 28 A82-14019 Rotor speed control by automatic yaving of two-bladed wind turbines with passive cyclic pitch variation [ATAM PAPER 81-2570] pol 29 A82-14027 Up- and down-wind rotor half interference model for YAWT Vertical Axis Wind Turbines [ATAM PAPER 81-2579] pol 29 A82-14031 Aram Paper 81-2579] pol 29 A82-14031 Aram Paper 81-2579] pol 30 A82-14034 Aram Analytic model of high solidity vertical axis windmills pol 31 A82-14360 First results from the UHass wind tunnel test program for windpowered generator optimization pol 34 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030031] Forman-Argentine experiment: Vertical-rotor wind engine pol 34 A82-1045 Application of orthotropic plate theory to windmill blade design pol 34 A82-10978 ROTOR BLADES (TURBORACHIMERY) ROTOR BLADES (TURBORACHIMERY) ROTOR BLADES (TURBORACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAM PAPER 81-2560] pol 28 A82-14019 Lightning protection for composite rotor blades of windpowered turbines pol 34 A82-14019 Lightning protection for composite rotor blades of windpowered turbines pol 34 A82-14039 ROTOR SPEED ROTOR SPEE	•		25	A82-	11826
performance and rotor optimization under constant RPRoperation [ATAA PAPER 81-2560] pol28 A82-14019 Botor speed control by automatic yaving of two-bladed wind turbines with passive cyclic pitch variation [ATAA PAPER 81-2570] pol29 A82-14027 Op- and down-wind rotor half interference model for YAWT Vertical Axis wind Turbines [ATAA PAPER 81-2579] pol29 A82-14031 Are particular wind turbines [ATAA PAPER 81-2552] pol30 A82-14034 An analytic model of high solidity vertical axis windmills pol34 A82-14360 Pirst results from the UMass wind tunnel test program for windpowered generator optimization [DR81-030091] German-Argentine experiment: Vertical-rotor wind engine pol34 A82-11045 ROTOR BLADES Application of orthotropic plate theory to windmill blade design pol24 A82-10978 ROTOR BLADES (*URBOBACHIMERY) Bethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPRoperation [ATAA PAPER 81-2560] pol28 A82-14019 Lightning protection for composite rotor blades of windpowered turbines PO133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine pol18 A82-14633 ROTOR SPEED ROTOR S	Methodology for the evaluation of ac-	rodv	na m	ic	
constant RPMoperation [ATAM PAPRE 81-2560] p0128 A82-14019 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [ATAM PAPRE 81-2570] p0129 A82-14027 UP- and down-wind rotor half interference model for VAWT Vertical Axis Wind Turbines [ATAM PAPRE 81-2579] p0129 A82-14031 Are analytic model of high solidity vertical axis windmills [ATAM PAPRE 81-2582] p0130 A82-14034 An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-174360 First results from the UMass wind tunnel test program for windpowered generator optimization [DE81-030091] p0138 N82-11045 Genman-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBORACHIMERY) Rethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [ATAM PAPEE 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines [NASA-TM-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows P0125 A82-11827 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows P0125 A82-11827 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows P0134 A82-17642 ROTORS ROTOR SPEED Performance testing of small wind energy conversion systems - An evaluation of a technique pitch variation [ATAM PAPEE 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p1034 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p1034 A82-17642 ROTORS Performance of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility P1028 ROTORS P0030 N82-15242 ROTAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17642 Project demonstration of wind-turbine	performance and reter entire ration	nnda			
ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES Application of orthotropic plate theory to windmill profession of the blade development for composite rotor blades ROTOR BLADES ROTOR SPEED ROTOR SPEED R			_		
Rotor speed control by automatic yaving of two-bladed wind turbines with passive cyclic pitch variation [AITAN PAPER 81-2570] Up- and down-wind rotor half interference model for VANT Vertical Axis Wind Turbines [AITAN PAPER 81-2579] Aerodynamic loads and rotor performance for the Darrieus wind turbines [AITAN PAPER 81-2582] An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind turnel test program for windpowered generator optimization pol34 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOMACHIMERY) Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPHoperation [AITAN PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines PO133 A82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Rotor speed control by automatic yaving of two-bladed wind turbines with passive cyclic pitch variation [AITAN PAPER 81-2570] Controlled veiocity testing of small wind energy conversion systems - An evaluation of a technique pitch variation [DE81-03085] Theoretical basis of the DOE-2 building energy use analysis program [DE81-03085] Performance of a small low speed Darrieus type rotor po134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor po134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor po134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor po134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor po134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor po134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor po134 A82-17642 ROTORS Performance of small low speed Darrieus type rotor po134 A82-17645 Project demonstration of wind-turbine elec		201	20	102	40040
two-hladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] D0129 A82-14027 Up- and down-wind rotor half interference model for VANT Vertical Axis Wind Turbines [AIAA PAPER 81-2579] D0129 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIAA PAPER 81-2582] p0130 A82-14034 An analytic model of high solidity vertical axis windmills p0131 A82-14034 An analytic model of high solidity vertical axis windmills p0134 A82-17643 First results from the UMass wind tunnel test program for windpowered generator optimization [DE81-030091] p0138 A82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 Application of orthotropic plate theory to windmill blade design p0141 N82-12648 Application of orthotropic plate theory to windmill blade design p0121 A82-10978 Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine p0143 N82-17631 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0155 A82-1827 Performance testing of a Savonius windmill rotor in shear flows p0155 A82-1827 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 Performance of a small low speed Darrieus type rotor p0136 A82-18328 Performance of a small low speed Darrieus type rotor p0136 A82-17642 Performance of a small low speed Darrieus type rotor p0136 A82-18328 Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-029614] p0138 N62-11380 RUTILE The use of semiconducting oxide ceramics in solar				H02-	14019
pitch variation [AIM PAPER 81-2570] p0129 A82-14027 Up- and down-wind rotor half interference model for VAWT Vertical Axis Wind Turbines [AIM PAPER 81-2579] p0129 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIM PAPER 81-2582] p0130 A82-14034 An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization [DE61-030091] p0138 A82-17643 Tawing of wind turbines with blade cyclic pitch variation [DE61-030091] p0138 A82-11045 German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOMACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIM PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines [NASA-MR-82594] p0143 A82-14619 Performance testing of a Savonius windmill rotor in shear flows Po125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled veiccity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUM TIME (COMPUTERS) Theoretical basis of the D0E-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RUM IMERS Wind energy and the Nation's rural electric systems p0136 A82-18328 Wind energy and the Nation's rural electric systems p0136 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-029614] p0138 N82-11380 RUHENIUB Transportation fuels from synthetic gas [DB81-029614] p0138 N82-11380					
[AIAA PAPER 81-2570] p0129 A82-14027 Up- and down-wind rotor half interference model for VAWT Vertical Axis Wind Turbines [AIAA PAPER 81-2579] p0129 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIAA PAPER 81-2582] p0130 A82-14034 An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] p0138 A82-11045 German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOMACHIMEN) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TR-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows ROTOR SPEED Performance of a small low speed Darrieus type rotor p0136 A82-1827 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS RUM TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028696] p0030 N82-15242 RUMAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Hichigan fruit farm with a major utility [DE81-029614] p0138 N82-11380 RUHENTURE Transportation fuels from synthetic gas RUBERTURE Transportation fuels from synthetic gas RUBERTURE The use of semiconducting oxide ceramics in solar		TAG (cyc	TTC	
Up- and down-wind rotor half interference model for VANT Vertical Axis Wind Turbines [AIAA PAPER 81-2579] p0129 A82-14031 Aerodymanic loads and rotor performance for the Darrieus wind turbines [AIAA PAPER 81-2582] p0130 A82-14034 An analytic model of high solidity vertical axis windmills p0131 A82-14360 Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] p0138 A82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 Application of orthotropic plate theory to windmill blade design p0121 A82-10978 MCTOR BLADES (TURBOMACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPHoperation [AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TR-82594] p0143 N82-14633 MCTOR SPRED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 Performance of a small low speed Darrieus type rotor p0136 A82-18328 Wind energy and the Nation's rural electric systems p0136 A82-18328 Wind energy and the Nation's rural electric systems p0136 A82-18328 Wind energy and the Nation's rural electric systems p0136 A82-18328 Wind energy and the Nation's rural electric systems p0136 A82-18328 Wind energy and the Nation's rural electric systems p0136 A82-18328 Wind energy and the Nation's rural electric systems p0136 A82-18328 Wind energy and the Nation's rural electric systems p0136 A82-18328 Wind energy and the Nation's rural electric systems p0136 A82-18328 Wind energy and the Nation's rural electric systems p	pitch variation				
for VAMY Vertical Axis Wind Turbines [AIAA PAPER 81-2579] pol29 A82-14031 Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIAA PAPER 81-2582] pol30 A82-14034 An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization pol34 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE61-030091] pol38 A82-11045 German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOMACHIMERY) Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] pol28 A82-14019 Lightning protection for composite rotor blades of windpowered turbines Pol33 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TR-82594] pol43 A82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Pol25 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] pol29 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique pol34 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor pol34 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor pol34 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor pol34 A82-17645 ROTORS Performance of a small low speed Darrieus type rotor pol34 A82-17645 ROTORS Performance of a small low speed Darrieus type rotor pol34 A82-17645 ROTORS Performance of a small low speed Darrieus type rotor pol34 A82-17645 ROTORS Performance of a small low speed Darrieus type rotor pol34 A82-17645 ROTORS Performance of a small low speed Darrieus type rotor pol34 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol34 A82-18328 ROTORS Performance of small index type rotor pol34	[AIAA PAPER 81-2570]	p01:	29	A82-	14027
Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIAM PAPER 81-2582] An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] BOTOR BLADES Application of orthotropic plate theory to windmill blade desagn ROTOR BLADES (TURBONACHIBERY) Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAM PAPER 81-2560] Aluminum blade development for the Mod-OA 200-kilowatt wind turbines [NASA-TM-82594] BOTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Po125 A82-11827 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Po125 A82-11827 ROTOR SPEED Performance of a small low speed Darrieus type rotor pitch variation [AIAM PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique po134 A82-17642 BOTORS BUTIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] BUSHENDH Transportation fuels from synthetic gas [DE81-0289614] DO102 M82-11258 BUSILE The use of semiconducting oxide ceramics in solar	Up- and down-wind rotor half interfe	renc	e m	odel	
Aerodynamic loads and rotor performance for the Darrieus wind turbines [AIAM PAPER 81-2582] An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] BOTOR BLADES Application of orthotropic plate theory to windmill blade desagn ROTOR BLADES (TURBONACHIBERY) Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAM PAPER 81-2560] Aluminum blade development for the Mod-OA 200-kilowatt wind turbines [NASA-TM-82594] BOTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Po125 A82-11827 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Po125 A82-11827 ROTOR SPEED Performance of a small low speed Darrieus type rotor pitch variation [AIAM PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique po134 A82-17642 BOTORS BUTIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] BUSHENDH Transportation fuels from synthetic gas [DE81-0289614] DO102 M82-11258 BUSILE The use of semiconducting oxide ceramics in solar	for VANT Vertical Axis Wind Tu.	rbin	es		
Aerodynamic loads and rotor performance for the Darrieus wind turbines [NIAN PAPER 81-2582] p0130 A82-14034 An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] p0138 N82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0121 A82-10978 ROTOR BLADES (TURBOMACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAN PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TH-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAN PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0134 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-020950] p0138 N82-11380 ROTHERUM Transportation fuels from synthetic gas [DE81-0209614] p0138 N82-11258 ROTILE The use of semiconducting oxide ceramics in solar				A82-	14031
Darrieus wind turbines [AIAA PAPER 81-2582] p0130 A82-14034 An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] p0138 N82-11045 German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0121 A82-10978 ROTOR BLADES (TURBOMACHIMERY) Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines [MASA-TH-82594] p0143 N82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [MASA-TH-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Performance testing of a Savonius windmill rotor in shear flows Performance testing of a Savonius windmill rotor in shear flows Performance testing of a Savonius windmill rotor in shear flows Performance testing of a Savonius windmill rotor in Alah PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUBAL ARBAS Find energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Hichigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUBHRHUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258	Aerodynamic loads and rotor performa-				
An analytic model of high solidity vertical axis vindmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization [D881-030091] German-Argentine experiment: Vertical-rotor wind engine ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOMACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAN PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines [MASA-TH-82594] ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows PO125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAN PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique po134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor po136 A82-18328 RUENT IME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [D881-028896] PURAL AREAS Wind energy and the Nation's rural electric systems po091 A82-17642 RUENT IME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [D881-028986] Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [D881-030950] PO138 N82-11380 RUTHERIUM Transportation fuels from synthetic gas [D881-029614] PO102 M82-11258 The use of semiconducting oxide ceramics in solar				CHC	
An analytic model of high solidity vertical axis windmills Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] German-Argentine experiment: Vertical-rotor wind engine P0141 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAN PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines P0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilovatt wind turbine [NASa-TH-82594] Performance testing of a Savonius windmill rotor in shear flows Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAN PAPER 81-2570] Controlled veiocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUMAL ARBAS Find energy and the Nation's rural electric systems p0091 A82-17642 ROTORS Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUMAL ARBAS Find energy and the Sation's rural electric systems p0091 A82-17645 ROTORS Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] ROTORS p0138 N82-11380 ROTORS p138-029614] P0102 N82-11258 ROTORS p0102 N82-11258	LYLY DYDAD 04-38031	201	30	1 A 2	18025
Pirst results from the UMass wind tunnel test program for windpowered generator optimization polish A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] polish A82-17045 German-Argentine experiment: Vertical-rotor wind engine polish blade generator of wind engine polish M82-1048 ROTOR BLADES Application of orthotropic plate theory to windmill blade design polish A82-10978 ROTOR BLADES (TURBORACHIMERY) Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAM PAPER 81-2560] polish A82-14019 Lightning protection for composite rotor blades of windpowered turbines polish A82-14633 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] polish N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows polish wind energy conversion systems - An evaluation of a technique polish A82-17642 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAM PAPER 81-2570] polish A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique polish A82-17642 ROTORS Performance of a small low speed Darrieus type rotor polish A82-18328 RUE TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DR81-028896] polish A82-15242 RUEAL AREAS Wind energy and the Nation's rural electric systems polish A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] polish N82-11380 RUTHERIUM Transportation fuels from synthetic gas [DB81-029614] policy M82-11258 The use of semiconducting oxide ceramics in solar					
Pirst results from the UMass wind tunnel test program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] P0138 M82-11045 German-Argentine experiment: Vertical-rotor wind engine P0141 M62-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design P0121 A62-10978 ROTOR BLADES (TURBOMACHIMERY) Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] P0128 A62-14019 Lightning protection for composite rotor blades off windpowered turbines P0133 A82-17631 Aluminum blade development for the Mod-0A 200-kilowatt wind turbine [MASA-TM-82594] P0143 M82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows P0155 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] P0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DR81-028896] P0030 M82-15242 RUBAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DR81-030950] P0138 M82-11380 RUTHERIUM Transportation fuels from synthetic gas [DR81-029614] P0102 M82-11258		erti	cal	arı	s
First results from the UMass wind tunnel test program for windpowered generator optimization avariation [DE81-030091] p0138 M82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 M82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0121 A82-10978 ROTOR BLADES (TUBBOHACHIMERY) Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPHOPERATION [AIAM PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TH-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAM PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUBAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DR81-030950] p0138 N82-11380 RUTINE Transportation fuels from synthetic gas [DR81-029614] p0102 M82-11258	windmills				
Program for windpowered generator optimization p0134 A82-17643 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOHACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIMA PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines P0133 A82-17631 Aluminum blade development for the Mod-0A 200-kilowatt wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows Po125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-17642 ROTORS Performance of wind-turbine electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility p1881-030950] ROTHERIUM Transportation fuels from synthetic gas [DE81-029614] The use of semiconducting oxide ceramics in solar					14360
Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] p0138 N82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0121 A82-10978 ROTOR BLADES (TURBORACHIBERY) Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPRoperation [AIAM PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAM PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique potores ROTORS Performance of a small low speed Darrieus type rotor p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RUBLAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258	First results from the Umass wind tu	nnel	te	st	
Yaving of wind turbines with blade cyclic pitch variation [DE81-030091] p0138 N82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 NPD p141 N82-12648 Application of orthotropic plate theory to windmill blade design p0121 A82-10978 NOTOR BLADES (TURBOMACHIBERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPNoperation [AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 NOTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor P0136 A82-18328 Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHEBIUM Transportation fuels from synthetic gas [DE81-029614] P0102 N82-11258 The use of semiconducting oxide ceramics in solar	program for windpowered general	tor o	opt	iniz	ation
Yaving of wind turbines with blade cyclic pitch variation [DE81-030091] p0138 N82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 NPD p141 N82-12648 Application of orthotropic plate theory to windmill blade design p0121 A82-10978 NOTOR BLADES (TURBOMACHIBERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPNoperation [AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 NOTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor P0136 A82-18328 Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHEBIUM Transportation fuels from synthetic gas [DE81-029614] P0102 N82-11258 The use of semiconducting oxide ceramics in solar	• • •	p01.	34	A82-	17643
variation [D881-030091] German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOHACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AITAN PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines p0133 A82-14631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows ROTOR SPEED Performance testing of savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AITAN PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] PO030 N82-15242 RUBAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE61-030950] RUTHERIUB Transportation fuels from synthetic gas [DE81-029614] RUTILE The use of semiconducting oxide ceramics in solar	Vaving of wind turbines with blade c				
[DE81-030091] p0138 N82-11045 German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0121 A82-10978 ROTOR BLADES (TURBOHACHIBERY) p0121 A82-10978 ROTOR BLADES (TURBOHACHIBERY) p0121 A82-10978 ROTOR BLADES (TURBOHACHIBERY) p0124 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS PO030 N62-15242 ROTAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm w1th a major utility [DE61-030950] ROTHERIUM Transportation fuels from synthetic gas [DE81-029614] ROTILE The use of semiconducting oxide ceramics in solar		10			
German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 ROTOR BLADES Application of orthotropic plate theory to windmill blade design p0121 A82-10978 ROTOR BLADES (TURBOHACHIBERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [ATAN PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines p0133 A82-14631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Polocit demonstration of the DOE-2 building energy use analysis program [DR81-028896] P0030 N82-15242 ROTAL ARRAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DR81-030950] ROTHEBUID Transportation fuels from synthetic gas [DR81-029614] ROTILE The use of semiconducting oxide ceramics in solar		501	30	1102	11005
ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOHACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAN PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines [NASA-TM-82594] ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Pol 28 A82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAN PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique pol 34 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor pol 36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol 36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol 36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol 36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol 36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol 36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol 36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol 36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol 36 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor pol 38 A82-11380 ROTORS Pol 38 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE61-030950] ROTORS ROTORS POL 38 A82-11380 ROTORS ROTORS ROTORS POL 38 A82-11380 ROTORS R					
ROTOR BLADES Application of orthotropic plate theory to windmill blade design ROTOR BLADES (TURBOMACHIBERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines P0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows P0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] P0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 EOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DB81-028896] P0030 N62-15242 RUBAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE61-030950] RUBHEBUUH Transportation fuels from synthetic gas [DB81-029614] RUTILE The use of semiconducting oxide ceramics in solar		T-E	oto	E MI	DŒ
ROTOR BLADES Application of orthotropic plate theory to windmill blade design PO121 A82-10978 ROTOR BLADES (TURBONACHIEREY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPRoperation [AIAA PAPEE 81-2560] Lightning protection for composite rotor blades of windpowered turbines PO133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows PO125 A82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows PO125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPEE 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] PO3030 N82-15242 RUBAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUBERIUM Transportation fuels from synthetic gas [DE81-029614] RUTILE The use of semiconducting oxide ceramics in solar	engine				
Application of orthotropic plate theory to windmill blade design p0121 A82-10978 ROTOR BLADES (TURBONACHIMERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows p0125 A82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS POTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS POTORS POTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 ROTORS POTORS POTO		P014	41	N82-	12648
Windmill blade design ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant EPMoperation [AIAA PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines P0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows Po125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique po134 A82-17642 BOTORS Performance of a small low speed Darrieus type rotor po136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor po136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor po136 A82-18328 BUBAL AREAS Wind energy and the Nation's rural electric systems po091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUTERBUIDH Transportation fuels from synthetic gas [DE81-029614] RUTILE The use of semiconducting oxide ceramics in solar					
ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPRoperation [AIAA PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows Po125 A82-14633 ROTOR SPEED Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique po134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor po136 A82-18328 ROTORS Performance of a small low speed Darrieus type rotor po136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] RUBAL AREAS Wind energy and the Nation's rural electric systems po091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUTHERIUM Transportation fuels from synthetic gas [DE81-029614] Total AREAS The use of semiconducting oxide ceramics in solar	Application of orthotropic plate the	orv 1	to		
ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines policy absolute wind turbine [NASA-TM-82594] Policy absolute wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows policy absolute wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique policy absolute program [DTORS Performance of a small low speed Darrieus type rotor policy Absolute program [DESI-028896] RUBAL ARBAS Wind energy and the Nation's rural electric systems policy absolute farm with a major utility [DES1-030950] RUBHERIUM Transportation fuels from synthetic gas [DB31-029614] RUTILE The use of semiconducting oxide ceramics in solar		,			
Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERUUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar		1			
Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERUUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar				A82-	10978
performance and rotor optimization under constant BPMoperation [AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TH-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 EOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUM TIME (COMPUIBES) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17642 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258	windmill blade design			A82 -	10978
Constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite rotor blades of windpowered turbines	windmill blade design ROTOR BLADES (TURBONACHIMERY)	p01.	21		10978
[AIAA PAPER 81-2560] p0128 A82-14019 Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 BOTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 BOTOBS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURAL AREAS Wind energy and the Nation's rural electric systems Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	windmill blade design ROTOR BLADES (TURBOHACHINERY) Methodology for the evaluation of ae.	p01.	21 nam		10978
Lightning protection for composite rotor blades of windpowered turbines p0133 A82-17631 Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 EOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUIBES) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258	windmill blade design ROTOR BLADES (TURBOHACHIBERY) Hethodology for the evaluation of ae performance and rotor optimization	p01.	21 nam		10978
Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] Performance testing of a Savonius windmill rotor in shear flows Performance testing of a Savonius windmill rotor in shear flows Poll25 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Poll29 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique pol34 A82-17642 BOTORS Performance of a small low speed Darrieus type rotor pol36 A82-18328 BUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] PO030 N62-15242 BURAL AREAS Wind energy and the Nation's rural electric systems pol91 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] BUTHERIUM Transportation fuels from synthetic gas [DB81-029614] BUTILE The use of semiconducting oxide ceramics in solar	windmill blade design ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation	p01. rody: unde	21 nam er	ic	
Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [MASA-TH-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 BOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUIERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258	windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of ae performance and rotor optimization constant BPMoperation (AIAA PAPER 81-2560)	p01. rody: undo p01:	21 nam er 28	ic 182-	14019
Aluminum blade development for the Mod-OA 200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 EOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258	windmill blade design ROTOR BLADES (TURBOHACHINERY) Methodology for the evaluation of ae performance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite residuals.	p01. rody: undo p01:	21 nam er 28	ic 182-	14019
200-kilowatt wind turbine [NASA-TH-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 ROTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUW TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258	windmill blade design ROTOR BLADES (TURBOHACHINERY) Methodology for the evaluation of ae performance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite residuals.	p01. rody; undo p01: otor	21 nam er 28 bl	ic A82- ades	14019
[NASA-TM-82594] p0143 N82-14633 ROTOR SPEED Performance testing of a Savonius windmill rotor	windmill blade design ROTOR BLADES (TURBOHACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite roof of windpowered turbines	p01. rody; undo p01: otor p01:	21 nam er 28 bl	ic A82- ades	14019
Performance testing of a Savonius windmill rotor in shear flows pol25 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique pol34 A82-17642 BOTOBS Performance of a small low speed Darrieus type rotor pol36 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] BURAL AREAS Wind energy and the Nation's rural electric systems poop1 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] BUTHERIUM Transportation fuels from synthetic gas [DB81-029614] RUTILE The use of semiconducting oxide ceramics in solar	windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acceptance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant and provided turbines Aluminum blade development for the Methodology	p01. rody; undo p01: otor p01:	21 nam er 28 bl	ic A82- ades	14019
Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 EOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUIBES) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] RURAL ARBAS Wind energy and the Nation's rural electric systems p0091 A82-15242 RURAL ARBAS Wind energy and the Nation's rural electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUTHERIUM Transportation fuels from synthetic gas [DB81-029614] RUTILE The use of semiconducting oxide ceramics in solar	windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acceptance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant and provided turbines Aluminum blade development for the Methodology	p01. rody; undo p01: otor p01:	21 nam er 28 bl	ic A82- ades	14019
Performance testing of a Savonius windmill rotor in shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 EOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUIBES) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] RURAL ARBAS Wind energy and the Nation's rural electric systems p0091 A82-15242 RURAL ARBAS Wind energy and the Nation's rural electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUTHERIUM Transportation fuels from synthetic gas [DB81-029614] RUTILE The use of semiconducting oxide ceramics in solar	windmill blade design ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant of windpowered turbines Aluminum blade development for the Machiber 200-kilowatt wind turbine	p01: undo p01: otor p01: od-0:	21 nam er 28 b1 33	A82- ades A82-	14019 17631
In shear flows p0125 A82-11827 Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 EOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	windmill blade design ROTOR BLADES (TURBOHACHIMERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite roof windpowered turbines Aluminum blade development for the Macanachime 200-kilowatt wind turbine	p01: undo p01: otor p01: od-0:	21 nam er 28 b1 33	A82- ades A82-	14019 17631
Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 BOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 BUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHERIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 BUTILE The use of semiconducting oxide ceramics in solar	windmill blade design BOTOR BLADES (TURBOHACHIMERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite resultance of windpowered turbines Aluminum blade development for the Machine 200-kilowatt wind turbine [NASA-TM-82594] BOTOR SPEED	p01: undo p01: otor p01: od-0:	21 nam er 28 b1 33 A	182- ades 182-	14019 17631 14633
Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 BOTOBS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of ae performance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the mindpowered turbines Aluminum blade development for the Mindpowered turbine [NASA-TM-82594] BOTOR SPEED Performance testing of a Savonius windstandard services [Nasa-TM-82594]	p01: undo p01: otor p01: od-0:	21 nam er 28 b1 33 A	182- ades 182-	14019 17631 14633
two-bladed wind turbines with passive cyclic pitch variation [AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 EOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUW TIME (COMPUIBES) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17649 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258	windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of ae performance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the mindpowered turbines Aluminum blade development for the Mindpowered turbine [NASA-TM-82594] BOTOR SPEED Performance testing of a Savonius windstandard services [Nasa-TM-82594]	p01. rody; undo p01: otor p01: od-0. p01:	21 namer 28 b1 33 A	A82- ades A82- N82-	14019 17631 14633 r
pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 EOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] PO030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUTHEWIUM Transportation fuels from synthetic gas [DE81-029614] RUTILE The use of semiconducting oxide ceramics in solar	windmill blade design ROTOR BLADES (TURBOHACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the mind of the m	p01. rody; undo p01: otor p01: od-0: p01: dmi.	21 namer 28 bl 33 43 11	A82- ades A82- N82-	14019 17631 14633 r
[AIAA PAPER 81-2570] p0129 A82-14027 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 BOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 BUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURAL ARBAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHEBIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258 BUTILE The use of semiconducting oxide ceramics in solar	windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acceptance and rotor optimization constant BPMoperation (AIAA PAPER 81-2560] Lightning protection for composite reconstant brownered turbines Aluminum blade development for the Magnonic value of the second constant wind turbine [NASA-TM-82594] ROTOR SPEED Performance testing of a Savonius with shear flows Rotor speed control by automatic yaw	p01: p01: otor p01: od-0: p01: ndmi.	21 namer 28 b1 33 A 43 11 25 of	182- ades 182- 182- roto	14019 17631 14633 r
Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique p0134 A82-17642 BOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUIBES) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURAL ARBAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258	windmill blade design ROTOR BLADES (TURBOHACHINERY) Methodology for the evaluation of ac- performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite r of windpowered turbines Aluminum blade development for the M- 200-kilowatt wind turbine [NASA-TH-82594] ROTOR SPEED Performance testing of a Savonius will in shear flows Rotor speed control by automatic yaw two-bladed wind turbines with pass.	p01: p01: otor p01: od-0: p01: ndmi.	21 namer 28 b1 33 A 43 11 25 of	182- ades 182- 182- roto	14019 17631 14633 r
conversion systems - An evaluation of a technique p0134 A82-17642 BOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHERIUM Transportation fuels from synthetic gas [DB81-029614] p0102 N82-11258 BUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the management of the Management for the Man	p01. p01. otor p01. od-0. p01. ndmi	21 namer 28 bl 33 A 43 11 25 cyc	A82-ades A82- N82- roto A82-	14019 17631 14633 r 11827
P0134 A82-17642 BOTORS Performance of a small low speed Darrieus type rotor p0136 A82-18328 BUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] BURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] BUTHEBIUM Transportation fuels from synthetic gas [DE81-029614] BUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acperformance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the management of the Managemen	p01.	21 namer 28 b1 33 A 43 11 25 of	A82- ades A82- roto A82- :lic	14019 17631 14633 r 11827
Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUIERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] RUBAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUTHERIUM Transportation fuels from synthetic gas [DE81-029614] RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acperformance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant and protection for composite reconstant and protection for composite reconstant wind turbines Aluminum blade development for the Magnetic statement of the Magnetic st	p01. rody. undo p01. p01. p01. p01. p01. p01. undo p01. p01. undo p01.	21 namer 28 b1 33 43 11 25 of cyc	A82-ades A82-roto A82-clic A82-energ	14019 17631 14633 r 11827
Performance of a small low speed Darrieus type rotor p0136 A82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHEBIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acperformance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant and protection for composite reconstant and protection for composite reconstant wind turbines Aluminum blade development for the Magnetic statement of the Magnetic st	p01.	21 nam er 28 bl 33 A 43 11 25 of cyc d a t	A82-ades A82-roto A82-roto A82-energeechn	14019 17631 14633 r 11827 14027 y 1que
p0136 Å82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUTHEBIUM Transportation fuels from synthetic gas [DE81-029614] RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Market	p01.	21 nam er 28 bl 33 A 43 11 25 of cyc d a t	A82-ades A82-roto A82-roto A82-energeechn	14019 17631 14633 r 11827 14027 y 1que
p0136 Å82-18328 RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUTHEBIUM Transportation fuels from synthetic gas [DE81-029614] RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acceptance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant blade development for the Magnetic statement of the Magnetic state	p01. rody und p01. rodor p01. p01. p01. p01. p01. p01. p01. p01.	21 namer 28 bl 33 A 31 125 cyc 29 da 4	A82- A82- N82- roto A82- Lic A82- nergechn	14019 17631 14633 r 11827 14027 y 1que 17642
THE (COMPUTERS) Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] BURAL ARBAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] BUTHERIUM Transportation fuels from synthetic gas [DE81-029614] BUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acceptance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant blade development for the Magnetic statement of the Magnetic state	p01. rody und p01. rodor p01. p01. p01. p01. p01. p01. p01. p01.	21 namer 28 bl 33 A 31 125 cyc 29 da 4	A82- A82- N82- roto A82- Lic A82- nergechn	14019 17631 14633 r 11827 14027 y 1que 17642
Theoretical basis of the DOE-2 building energy use analysis program [DE81-028896] p0030 N82-15242 BURAL ARBAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHERIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 BUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acceptance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant blade development for the Magnetic statement of the Magnetic state	p01. rive	21 namer 28 13 3 4 3 11 25 cyc 29 ed a 4 t t t	A82- A82- N82- roto A82- Lic A82- A82- Lype	14019 17631 14633 r 11827 14027 y 19ue 17642 rotor
analysis program [DR81-028896] p0030 N62-15242 BURAL ARBAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DR81-030950] p0138 N62-11380 BUTHEBIUM Transportation fuels from synthetic gas [DR81-029614] p0102 N82-11258 BUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBOHACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Market and the second secon	p01. rive	21 namer 28 13 3 4 3 11 25 cyc 29 ed a 4 t t t	A82- A82- N82- roto A82- Lic A82- A82- Lype	14019 17631 14633 r 11827 14027 y 19ue 17642 rotor
[DE81-028896] p0030 N82-15242 RURAL AREAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHEBIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Market	p01. p01. p01. p01. p01. p01. p01. p01.	21 namer 28 bl 33 A 43 ll 25 f y c 29 e 4 t 536 bl 536 bl 536	100 A82- A82- N82- roto A82- Hic A82- nergeneas	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328
WIRAL ARBAS Wind energy and the Nation's rural electric systems p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] POTHEBIUM Transportation fuels from synthetic gas [DE81-029614] RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acceptance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant and protection and protection for composite reconstant and protection and turbines Rotor speed control by automatic yaw two-bladed wind turbines with passing pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small conversion systems - An evaluation EOTORS Performance of a small low speed Dar RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 build	p01. p01. p01. p01. p01. p01. p01. p01.	21 namer 28 bl 33 A 43 ll 25 f y c 29 e 4 t 536 bl 536 bl 536	100 A82- A82- N82- roto A82- Hic A82- nergeneas	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328
Wind energy and the Nation's rural electric systems p0091 A82-1764; Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHERIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBOHACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant reco	p01.	21 nam er 28 b1 33 A 3 11 25 cyc 29 ea 4 t 36 en 6	A82- A82- roto A82- Lic A82- A82- Lype A82-	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use
p0091 A82-17645 Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 RUTHENIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Market and turbines Aluminum blade development for the Market and turbine [NASA-TM-82594] BOTOR SPEED Performance testing of a Savonius with a shear flows Rotor speed control by automatic yaw two-bladed wind turbines with passipitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small conversion systems - An evaluation BOTORS Performance of a small low speed Dar RUB TIME (COMPUIBES) Theoretical basis of the DOE-2 build analysis program [DE81-028896]	p01.	21 nam er 28 b1 33 A 3 11 25 cyc 29 ea 4 t 36 en 6	A82- A82- roto A82- Lic A82- A82- Lype A82-	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use
Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] RUTHBNIUM Transportation fuels from synthetic gas [DE81-029614] RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acperformance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Minimal protection for composite results of the Minimal PMOPER 81-2500] Aluminum blade development for the Minimal PMOPER 81 (NASA-TM-82594) ROTOR SPEED Performance testing of a Savonius with a shear flows Rotor speed control by automatic yaw two-bladed wind turbines with passibility pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small conversion systems - An evaluation ROTORS Performance of a small low speed Dar RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 build analysis program [DE81-028896] RUBAL AREAS	p01.	21 mer 28 1 28 1 2 2 3 3 4 3 1 1 2 5 f 29 e t 2 3 3 4 5 6 e 6 3 0	A82- ades A82- N82- roto A82- echn A82- echn A82- rype A82- rgy	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242
Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHERIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 BUTLE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acperformance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Minimal protection for composite results of the Minimal PMOPER 81-2500] Aluminum blade development for the Minimal PMOPER 81 (NASA-TM-82594) ROTOR SPEED Performance testing of a Savonius with a shear flows Rotor speed control by automatic yaw two-bladed wind turbines with passibility pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small conversion systems - An evaluation ROTORS Performance of a small low speed Dar RUB TIME (COMPUTERS) Theoretical basis of the DOE-2 build analysis program [DE81-028896] RUBAL AREAS	p01.	21 mer 28 1 28 1 3 3 4 3 1 1 2 5 f 5 7 5 6 6 6 7 6 6 7 6 6 7 6 7 6 7 6 7 6	A82- A82- N82- roto A82- lic A82- ecchnergy N82- ergy N82- ergy N82- ersys	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems
Interconnecting a northern Michigan fruit farm with a major utility [DE81-030950] p0138 N82-11380 BUTHERIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 BUTLE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBOHACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Methodology for the Method	p01.	21 mer 28 mer 28 mer 28 mer 28 mer 28 mer 29	11C A82- 182- 182- 11C A82- 11C	14019 17631 14633 r 11827 14027 y 1 que 17642 rotor 18328 use 15242 tems 17645
with a major utility [DE81-030950] p0138 N82-11380 RUTHENIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acperformance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Minimal protection for the Minimal protection for the Minimal protection of a Savonius with a Savonius with shear flows Rotor speed control by automatic yaw two-bladed wind turbines with passion pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small conversion systems - An evaluation protection systems - An evaluation manalysis program [DE81-028896] RUBAL AREAS Wind energy and the Nation's rural eproject demonstration of wind-turbin	p01.	21 nam	A82- A82- N82- roto A82- Lic A82- Lechn A82- N82- Sype A82- Sys	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems 17645 ty:
[DE81-030950] p0138 N82-11380 RUTHEBIUM Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acperformance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Minimal protection for the Minimal protection for the Minimal protection of a Savonius with a Savonius with shear flows Rotor speed control by automatic yaw two-bladed wind turbines with passion pitch variation [AIAA PAPER 81-2570] Controlled velocity testing of small conversion systems - An evaluation protection systems - An evaluation manalysis program [DE81-028896] RUBAL AREAS Wind energy and the Nation's rural eproject demonstration of wind-turbin	p01.	21 nam	A82- A82- N82- roto A82- Lic A82- Lechn A82- N82- Sype A82- Sys	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems 17645 ty:
RUTHREIUM Transportation fuels from synthetic gas [DE81-029614] p0102 M82-11258 RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acceptance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite receptance turbines Aluminum blade development for the Magnetic structure of windpowered turbines Aluminum blade development for the Magnetic structure of windpowered turbine [NASA-TM-82594] ROTOR SPEED Performance testing of a Savonius with a shear flows Rotor speed control by automatic yaw two-bladed wind turbines with passifich variation [AIAA PAPER 81-2570] Controlled velocity testing of small conversion systems - An evaluation EOTORS Performance of a small low speed Dar RUB TIME (COMPUIBES) Theoretical basis of the DOE-2 build analysis program [DE81-028896] RURAL ARBAS Wind energy and the Nation's rural e	p01.	21 nam	A82- A82- N82- roto A82- Lic A82- Lechn A82- N82- Sype A82- Sys	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems 17645 ty:
Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite received turbines Aluminum blade development for the Magnetic state of the state of t	p01.	21 mar 28 mar 29 mar 20	A82- A82- Incomplete the second of the secon	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems 17645 ty: m
[DE81-029614] p0102 N82-11258 RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBOHACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant reco	p01.	21 mar 28 mar 29 mar 20	A82- A82- Incomplete the second of the secon	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems 17645 ty: m
RUTILE The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of acperformance and rotor optimization constant BPMoperation [AIAA PAPER 81-2560] Lightning protection for composite results of the Market of	p01.	21 mar 28 mar 29 mar 20	A82- A82- Incomplete the second of the secon	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems 17645 ty: m
The use of semiconducting oxide ceramics in solar	Windmill blade design ROTOR BLADES (TURBONACHINERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite received the second and second and second are second as a second as	p01. rody. r	21 mar 28 mar 29 mar 20	A82- A82- N82- roto A82- lic A82- echn A82- ype A82- sys A82- rici far N82-	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems 17645 ty: m
	Windmill blade design ROTOR BLADES (TURBOHACHINERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite reconstant reco	p01. rody. r	21 mar 28 mar 29 mar 20	A82- A82- N82- roto A82- lic A82- echn A82- ype A82- sys A82- rici far N82-	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems 17645 ty: m
	Windmill blade design ROTOR BLADES (TURBONACHIBERY) Methodology for the evaluation of ae performance and rotor optimization constant RPMoperation [AIAA PAPER 81-2560] Lightning protection for composite result of the Market	p01.	21 mar e 2 b 1	A82- ades A82- IN82- roto A82- lic A82- eechn A82- rype A82- rype A82- rsys R82- R1ci far N82-	14019 17631 14633 r 11827 14027 y 1que 17642 rotor 18328 use 15242 tems 17645 ty: m

S SAPETY Space nuclear safety and fuels program p0111 N82-12921 Operations of small wind turbines on a distribution system p0133 A82-17633 SAPETY PACTORS Aspects concerning the safety of hydrogen p0085 A82-17132 Experiences with a Grunnan windstream 25 --horizontal axis wind turbine p0134 A82-17638 SAPRTY MANAGEMENT Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts --in coal plants [BMFT-FB-HA-80-048] p0096 N82-10279 Pire-protection research for energy technology: Py 80 year end report [DE82-000970] p0161 N82-14649 SALTS Thermal storage in salt-hydrates p0153 A82-10018 SAMPLING Techniques for geothermal liquid sampling and analysis [DE81-030151] Sampling design for the 1980 commercial and multifamily residential building survey p0011 N82-11320 [DE81-028783] SATELLITE HETWORKS Solar power satellite system energy balance p0050 A82-12509 Effects of the Satellite Power System on low Earth orbit and geosynchronous satellites
[PB81-232019]
SATELLITE POWER TRANSMISSION (TO BARTH) p0150 N82-13157 Solar power satellite microwave power transmission and reception system p0145 A82-11743 Antenna optimization and cost consideration for the Solar Power Satellite microwave system p0145 A82-11744 Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Microwave power transmission by satellites p0145 A82-12503 Space chamber experiments of ohmic heating by high power microwave from the Solar Power Satellite p0145 A82-16991 Status of the microwave power transmission components for the solar power satellite p0146 A82-17982 Workshop on Microwave Power Transmission and Reception. Workshop paper summaries [NASA-TM-84064] p0146 N82-12538 An active alignment scheme for the MPTS array p0147 N82-12541 Ionospheric power beam studies p0147 N82-12542 Proposed experimental studies for assessing ionospheric perturbations on SPS uplink pilot beam signal p0147 N82-12543 Coherent multiple tone technique for ground based SPS phase control p0147 N82-12546 An interferometer-based phase control system p0147 N82-12547 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SPS phase control studies p0147 N82-12549 SPS fiber optic link assessment p0147 N82-12550 Effects of the Satellite Power System on low Earth

orbit and geosynchronous satellites [PB81-232019]

Advanced Satellite Power System /SPS/ concept

SATELLITE SOLAR ENERGY CONVERSION

p0059 A82-17099

p0150 N82-13157

p0049 A82-11839

Investigation of direct sclar-to-micro	owawe energy	SCALING LAWS	
conversion techniques [NASA-CR-161883]	p0067 N82-11544	MHD generator scaling analysis for be commercial power plants	aseload
Silicon solar cell optimization		[AIAA PAPER 82-0394]	p0135 A82-17922
[AD-A106005] Satellite power system: Concept devel	p0076 N82-13514	SCHEDULES Hagnetohydrodynamics HHD Engineering	Tost Pacility
evaluation program. Volume 4: Ener	rgy	ETF 200 HWe power plant. Conceptu	al Design
conversion and power management	-0070 NO2 44634	Engineering Report CDER. Volume 3	: Costs and
[NASA-TH-58237-VCL-4] SATELLITE SOLAR POWER STATICES	P0078 N82-14634	schedules [NASA-CR-165452-VOL-3]	p0137 N82-10495
Satellite power systems /SPS/ energy	conversion	SCHOTTKY DIODES	
and power management	p0045 A82-11742	Carrier-collection efficiencies in a nydrogenated silicon Schottky-barr	morphous ier solar cells
International Scientific Conference of	n Space,		p0042 A82-11185
21st, Rome, Italy, Harch 25, 26, 19	81, Proceedings p0050 A82-12501	Low frequency capacitance characteri indium/x-phase of metal free phtha	
Market potential and problems for SSP		solar cells	
	p0050 A82-12502	A pinhole model for metal-insulator-	p0053 A82-13806
Methods and problems of industrial-sca power generation from sclar energy	ire electric	solar cells	Semiconductor
	P0050 A82-12506	l commission of m i m and Calabetes h	p0056 A82-15442
Status of the microwave power transmis components for the sclar power sate:		A comparison of p-i-n and Schottky be hydrogenated amorphous silicon, a-	
	P0146 A82-17982	cells	
System performance conclusions	p0146 N82-12539	Controlled cadmium telluride thin fi	p0060 A82-17649
SPS large array simulation	P0.40 B02 (200)	solar-cell applications	
Performance analysis and simulation of	0071 N82-12540	[DE81-023275] SCRUBBERS	p0066 N82-10569
reference phase control system	t the SPS	Demonstration of Wellman-Lord/Allied	Chemical PGD
	0071 N82-12544	technology: Demontration test sec	
Coherent multiple tone technique for of SPS phase control	ground Dased	[PB81-246316] SEA WATER	p0034 N82-15626
	0147 N82-12546	Experimental demonstration of the fe	
The adapting of the crossed-field dire amplifier to the requirements of the		the Mist Plow Ocean Thermal Energy [AIAA PAPER 81-2596]	p0136 A82-18220
	0148 N82-12554	Response of the oceans to increasing	
SPS antenna element evaluation	0148 N82-12555	carbon dioxide [DE81-028178]	p0025 N82-13558
The Resonant Cavity Radiator (RCR)		SBASAT SATELLITES	•
Evaluation of thick wall wave guide el	0148 N82-12556	The Seasat connercial demonstration	program p0115 N82-14561
i	P0148 N82-12557	SECULAR VARIATIONS	-
Method for precision forming of low-co thin-walled slotted waveguide arrays		The annual variation of atmospheric (concentration observed in the North	
	P0148 N82-12558		p0002 A82-12156
Considerations for high accuracy radia efficiency measurements for the Sola		SEDIMENT TRANSPORT Chemical and geochemical studies off	the coast of
Satellite (SPS) subarrays	r roter	Washington	
The history of the development of the	0148 N82-12559	[DE81-030319] SELECTIVE DISSEMBLATION OF INFORMATION	p0017 N82-12513
	0149 N82-12560	Information resources in the USA on	new and
Rectenna system design	-01/10 NOS-13561	renewable energy, a description and [DE81-028867]	d directory p0024 N82-13522
Rectenna session: Micro aspects	0149 N82-12561	SELENIUM	puu24 802-13322
	0149 N82-12562	Investigations on a Se-CdO photovolta	aic cell p0132 A82-16052
A theoretical study of microwave beam by a rectenna	ansorbtion	SEMICORDUCTING PILMS	PU 132 NO2-10032
	0149 N82-12563	The optimization of solar conversion	devices p0039 A82-10025
Rectenna array measurement results	0149 N82-12564	V205-Si photovoltaic cells	P0033 A02-10023
Session on solid state: Introduction	0140 802 12545	TIT-U mples low	p0051 A82-12824
Modified reference SPS with solid state	0149 N82-12565 te	A new low temperature III-V multilayo technique - Vacuum metalorganic cho	
transmitting antenna		deposition of Galas thin films	-
SPS solid state antenna power combiner	0149 N82-12566	Nickel sulphide-lead sulphide and nic	p0053 A82-13803 ckel
	0149 N82-12567	sulphide-cadmum sulphide selective	
Solid-state retrodirective phased arra for microwave power transmission fro		solar thermal conversion	p0059 A82-16745
Power Satellite		Metallurgical coatings 1980; Proceed:	ings of the
Satellite power system: Concept devel	0149 N82-12568	Seventh International Conference, S April 21-25, 1980. Volumes 1 & 2	San Diego, CA,
evaluation program. Volume 4: Ener		•	p0161 A82-17251
conversion and power management [NASA-TM-58237-VOL-4]	0078 N82-14634	SEMICORDUCTOR DRVICES Semiconductor converters/inverters for	ar.
Satellite power system: Concept devel		photovoltaic power supply	,.
evaluation program. Volume 7: Space transportation	e	Increasing power and efficiency by d	p0126 A82-11857
	0078 N82-14635	suppression of ionization instabili	
SAUDI ARABIA			p0127 A82-12897
Utilization of wind/solar energy in generation of w	suecating	Dependence of minority carrier diffus illumination level and temperature	in single
	0049 A82-11830	crystal and polycrystalline Si sola	ar cells p0053 182-13804
The effect of variable fluid properties		Electrochemical photovoltaic cells	•
modeling of solar central received	vers 00049 A82-12269	[DE81-769704]	p0066 N82-10568
	404-14407		

. -

SUBJECT THDEX SILICON ALLOYS

SBMICOMDUCTOR JUNCTIONS Advanced high temperature thermoelectrics for space power	Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island
p0125 A82-11823 Current-voltage characteristics of	[DE81-030895] p0104 N82-11523 Pyrolytic characterization of the organic matter
semiconductor-electrolyte junction solar cells p0055 A82-15112 A new structure for a	in selected coals and in the Devonian shales of southern West Virginia p0113 N82-13578
semiconductor-insulator-semiconductor solar cell p0057 A82-15911	Byaluation of Devonian shale potential in eastern Kentucky/Tennessee
SENICONDUCTORS (MATERIALS) Heterojunctions for thin film solar cells p0039 A82-10024	[DE82-001164] p0116 M82-14595 SHBAR PLOW Performance testing of a Savonius windmill rotor
The use of semiconducting oxide ceramics in solar energy conversion	in shear flows p0125 A82-11827
p0059 A82-17099 Model based studies of sche optical and electronic properties of narrow and wide gap materials	Study of gelled LNG [DE81-023259] p0095 N82-10269 SHEAR LAYERS
p0062 A82-18471 SEPARATION	A two-dimensional study of the maximum power that can be obtained from a wind turbine in a wind
Selective separation of coal feedstocks for conversion by magnetic separation techniques [DE81-028060] p0108 N82-12263	shear layer [FFA-134] p0140 N82-12537 SHELTERS
SEPARATORS Laboratory study for removal of organic sulfur	Earth shelter 2. 1979-1980 USC series [CONF-800438] p0006 N82-10277
from coal [DE81-025132] Development of battery separator composites	SHIRLDING The effect of shielding on the aerodynamic performance of Savonius wind turbines
[NASA-CR-165508] p0157 N82-11547 SERVICE LIFE	p0125 A82-11826 SHIPS
Introduction to solar materials science p0037 A82-10008 Effect of depth of discharge on cycle life of	A design for an MHD power plant as a prime mover for a Naval Vessel [AIAA PAPER 81-2575] p0129 A82-14032
near-term fatteries p0153 A82-11714	SHORT CIRCUITS Temperature dependence of the short-circuit
Ampere-hour integrator tattery charge controller p0153 A82-11737 Life-testing of 1.7 kW h zinc-chloride battery	current in MIS solar cells p0052 A82-12825 SHROUDED TURBINES
system - Cycles 1 - 1000 p0155 A82-18498	Computational analysis of diffuser-augmented wind turbines
SERVICE MODULES Modular hydro dam approach to the economic development of ultra low-head hydropower	p0132 A82-16743 SILANES Introduction to basic aspects of plasma-deposited
[DE81-027817] p0019 N82-12635 SEWAGE TREATMENT	amorphous semiconductor alloys in photovoltaic conversion
Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620	p0039 A82-10026 Carrier-collection efficiencies in amorphous hydrogenated silicon Schottky-barrier solar cells p0042 A82-11185
Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633	Impurity effects in a-Si:H solar cells [DE81-025069] p0069 N82-11575
SHALE OIL Application of HTGR process heat to oil shale retorting	SILICA GLASS Optical degradation of antireflective silica film on solar collector windows
p0090 A82-11851 Jet fuel locks to shale cil: The 1980 technology	p0041 A82-10836
review [AD-A104414] p0100 N82-11228	V205-Si photoVoltaic cells p0051 A82-12824
Assessment of oil-shale technology in Brazil [DE81-027574] p0010 N82-11249 Geology of the nahcolite deposits and associated	Amorphous silicon bibliography - Introduction p0053 A82-13737 High efficiency inversion layer solar cells on
oil shales of the Green Biver Formation in the Piceance Creek Basin, Colorado	polycrystalline silicon by the application of silicon nitride
p0105 N82-11683 Investigation of factors affecting the in-situ combustion retorting cf cil shale [DE82-000482] p0106 N82-12200	p0058 A82-16127 Thin-film polycrystalline cadmium telluride solar cells and large-area polycrystalline silicon solar cells
Evaluation of shale oil as a utility gas-turbine fuel	p0062 N82-10490 The effects of impurities on the performance of
[DE81-904234] p0107 M82-12251 Meteorological and climatological investigation: Roylew of January - June 1980 investigative period	silicon solar cells [NASA-CH-164945] p0067 N82-11548 A Module Experimental Process System Development
[DE81-030740] p0111 N82-12731 Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766	Unit (MEPSDU) [NASA-CE-165014] Plat-plate solar array project. Task 1: Silicon material: Investigation of the
Solar-central-receiver fuels and chemicals [DB82-000941] p0077 N82-13530	hydrochlorination of SiC1sub4 [NASA-CR-165042] p0078 N82-14631
Design and test of two-step solar cil shale retort [DE82-000964] p0077 N82-13543 Development of superior denitrogenation and	SILICON ALLOYS Progress in large area photovoltaic devices based on amorphous silicon alloys
isomerization catalysts for processing crude oil derived from shale, part 1	p0049 A82-11855 Amorphous boron-silicon-hydrogen alloys for
[AD-A105667] p0113 N82-14317 SHALES Aluminum recovery from fly ash and shale-retort	thin-film heterojunction solar cells [DE81-027254] p0068 N82-11558 Impurity effects in a-Si:H solar cells
wastes [DE81-027675] p0099 N82-11154	[DE81-025069] p0069 N82-11575

SILICON CARBIDES	Siting and land-use considerations in wind energy
Characteristics of CVD silicon carbide thermionic converters	development [AIAA PAPER 81-2541] p0003 A82-14009
p0124 A82-11821	Preliminary design study of underground pumped
SILICON COMPOUNDS Stability of n-i-p amorphous silicon solar cells	hydro and compressed-air energy storage in hard rock. Volume 5: Site selection
p0043 A82-11343	[DB81-028199] p0156 N82-10529
SILICON PILMS Low cost silicon-on-ceramic photovoltaic solar cells	Analysis of data from the US Department of Energy's meteorological validation program
p0059 A82-17098 SILICON JUNCTIONS	[DE81-030100] p0097 N82-10655 Low/medium-Btu coal-gasification assessment
Efficient Si solar cells by low-temperature	program for specific sites of two New York
solid-phase epitaxy p0043 A82-11344	utilities [DE81-025518] p0101 N82-11240
Cascade photogenerators based on silicon and	Site selection for small wind energy conversion
germanium matrix photoccnverters p0044 A82-11422	systems for US Department of Energy field evaluation program
Thin foil cells - A challenge for space array	[PB81-226862] · p0014 N82-11624
designers* p0049 A82-11842	Geothermal reservoir assessment: Borthern basin and range province Stillwater prospect,
Series resistance effects in 20 sq cm indiam tin	Churchill County, Nevada
oxide-polycrystalline silicon solar cells p0051 A82-12819	[DE82-000529] p0109 N82-12516 Environmental data for sites in the National Solar
Oxide optimization at the p-Si/aqueous electrolyte	Data Network
interface p0052 A82-13199	[DE82-000071] p0075 N82-12707 Residual-energy-applications program environmental
Production and certain properties of photoelectric cells based on silicon epitaxial structures	analysis report industrial scale waste heat recovery equipment and utilization
p0053 A82-13716	[uB81-027538] p0024 N82-13525
Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and	Application of Bayesian analysis for wind energy site evaluation
application to concentrating collectors	p0113 N82-13619
Prench thesis p0055 A82-15006	Sixth Underground Coal-Conversion Symposium [DE81-027669] p0114 N82-14374
Theory of back surface field silicon solar cells	Hot dry rock geothermal prospects, 1981
p0056 A82-15447 Grain size dependence of the photovoltaic	[DE81-025305] p0119 882-15559
properties of solar grade polysilicon	GRAD: A tool for program analysis and progress
p0057 A82-16051 A study of the purification process during the	monitoring [DE81-028098] p0120 N82-15981
elaboration by electron bombardment of	SIZE DETERMINATION
polysilicon ribbons designed for photovoltaic conversion	One viewpoint concerning unit size in the development of wind turbines
p0057 A82-16054	p0131 A82-14845
	4.144
K/u/-band flat-profile Si-IMPATT diodes with 10-percent efficiency	SLAGS Advances in coal fired MHD generator research
10-percent efficiency p0058 A82-16132	Advances in coal fired MHD generator research p0126 A82-11853
10-percent efficiency	Advances in coal fired MHD generator research
10-percent efficiency p0058 A82-16132 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173
10-percent efficiency p0058 A82-16132 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator
10-percent efficiency p0058 A82-16132 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550
10-percent efficiency p0058 A82-16132 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680
10-percent efficiency p0058 A82-16132 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells	Advances in coal fired MHD generator research p0126 A82-11853 Hass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTERNAS
10-percent efficiency p0058 A82-16132 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells p0060 A82-17649 SILICON MITRIDES	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTENNAS SPS antenna element evaluation p0148 N82-12555
10-percent efficiency p0058 A82-16132 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells p0060 A82-17649 SILICON NITRIDES Eigh efficiency inversion layer solar cells on	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 SLOT ANTENNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element
10-percent efficiency	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] SLOT ANTENNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost,
10-percent efficiency	Advances in coal fired MHD generator research p0126 A82-11853 Hass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator Coal conversion solid waste disposal [DE81-028567] p0116 N82-13550 SLOT ANTERNAS SPS antenna element evaluation P0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12555
10-percent efficiency	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTERMAS SPS antenna element evaluation P0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE
10-percent efficiency p0058 A82-16132 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells \$\text{P0060 A82-17649}\$ SILICON MITRIDES Eigh efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride \$\text{P0058 A82-16127}\$ SILVER ZIEC BATTERIES	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 SLOT ANTENNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558
10-percent efficiency Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells P0060 A82-17649 SILICON MITRIDES Eigh efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride P0058 A82-16127 SILVER ZIEC BATTERIES Development of battery separator composites [MASA-CR-165508] SIMULATORS Solar heat pump simulator	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator [DE81-028567] p0143 N82-13550 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 SLOT ANTERNAS SPS antenna element evaluation P0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants
10-percent efficiency	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 SLOT ANTERNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S.
10-percent efficiency 10-percent efficiency Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells P0060 A82-17649 SILICON NITRIDES Eigh efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride P0058 A82-16127 SILVER ZINC BATTERIES Development of battery separator composites [NASA-CR-165508] SINULATORS Solar heat pump simulator [DE81-024368] A sonic satellite power system microwave power transmission simulator	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 SLOT ANTERMAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DE81-029958] Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed
10-percent efficiency 10-percent efficiency Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells P0060 A82-17649 SILICON HITRIDES Bigh efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride P0058 A82-16127 SILVER ZIEC BATTERIES Development of battery separator composites [NASA-CR-165508] P0157 N82-11547 SIMULATORS Solar heat pump simulator [DE81-024368] A sonic satellite power system microwave power transmission simulator P0147 N82-12548	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTERNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DB81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DB82-001142] p0110 N82-12596
10-percent efficiency 10-percent efficiency Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells P0060 A82-17649 SILICOB MITRIDES High efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride P0058 A82-16127 SILVER ZIMC BATTERIES Development of battery separator composites [MASA-CR-165508] P0157 N82-11547 SIMULATORS Solar heat pump simulator [DE81-024368] A sonic satellite power system microwave power transmission simulator P0147 M82-12548 SIMTERIEG Production of alloys of bismuth telluride for	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTERNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DB81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DB82-001142] p0110 N82-12596 Kinetics of wet oxidation of biological sludges
10-percent efficiency Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells P0060 A82-17649 SILICON MITRIDES Eigh efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride P0058 A82-16127 SILVER ZINC BATTERIES Development of battery separator composites [MASA-CR-165508] SOlar heat pump simulator [DE81-024368] A sonic satellite power system microwave power transmission simulator P0147 M82-12548 SIMTERIEG Production of alloys of bismuth telluride for solar thermoelectric generators	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTERMAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DB81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DB82-001142] p0110 N82-12596 Kinetics of wet oxidation of biological sludges from coal-conversion wastewater treatment [DB82-000525] p0021 N82-12674
10-percent efficiency 20-percent efficiency 20-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 20-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 20-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 20-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 20-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 20-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 20-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 20-percent efficiency inversion layer solar cells on polycrystalline silicon polycrystalline silicon polycrystalline silicon polycrystalline silicon efficiency inversion layer solar cells on polycrystalline silicon efficiency inversion layer solar cells on polycrystalline silicon efficiency inversion layer solar cells efficiency efficiency efficiency efficiency inversion layer solar cells efficiency efficie	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434]
Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells p0060 A82-17649 SILICOB MITRIDES Eigh efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride p0058 A82-16127 SILVER ZIBC BATTERIES Development of battery separator composites [MASA-CR-165508] p0157 N82-11547 SIMULATORS Solar heat pump simulator [DE81-024368] p0070 N82-11583 A sonic satellite power system microwave power transmission simulator p0147 N82-12548 SIMTERIEG Production of alloys of bismuth telluride for solar thermoelectric generators P0041 A82-10471 Effect of annealing Cds on a sintered Cds/Cu2S solar cell p0051 A82-12820	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTERNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DE81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Kinetics of wet oxidation of biological sludges from coal-conversion wastewater treatment [DE82-000525] p0021 N82-12674 SLUBRIES Thermophysical properties of coal liquids [DE81-0279446] p0097 N82-10938
10-percent efficiency 10-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 10-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 10-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 10-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 10-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 10-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 10-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 10-percent efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nutride 10-percent efficiency inversion layer solar cells on polycrystalline silicon efficiency inversion by the application of silicon nutride polycrystalline silicon efficiency inversion by the application of silicon efficiency inversion by the application of silicon efficiency inversion by the application of polycrystalline silicon exists efficiency inversion silicon efficiency inversion sil	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTERNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DE81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Kinetics of wet oxidation of biological sludges from coal-conversion wastewater treatment [DE82-000525] p0021 N82-12674 SLUBRIES Thermophysical properties of coal liquids [DE81-0279446] p0097 N82-10938 Transport characteristics of alternate slurry fuels
Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells p0060 A82-17649 SILICON NITRIDES Eigh efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride p0058 A82-16127 SILVER ZINC BATTERIES Development of battery separator composites [NASA-CR-165508] p0157 N82-11547 SIMULATORS Solar heat pump simulator [DE81-024368] p0070 N82-11583 A sonic satellite power system microwave power transmission simulator P047 N82-12548 SINTERING Production of alloys of bismuth telluride for solar thermoelectric generators p0041 A82-10471 Effect of annealing CdS on a sintered CdS/Cu2S solar cell P0051 A82-12820 SIS (SEMICOBDUCTORS) A new structure for a semiconductor solar cell	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 SLOT ANTENNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DE81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] Kinetics of wet oxidation of biological sludges from coal-conversion wastewater treatment [DE82-000525] p0021 N82-12596 SLUBRIES Thermophysical properties of coal liquids [DE81-0279446] p0097 N82-10938 Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255
Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells P0060 A82-17649 SILICON HITRIDES High efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride P0058 A82-16127 SILVER ZIMC BATTERIES Development of battery separator composites [NASA-CR-165508] P0157 N82-11547 SIMULATORS Solar heat pump simulator [DE81-024368] A sonic Satellite power system microwave power transmission simulator P0147 N82-12548 SINTERIEG Production of alloys of bismuth telluride for solar thermoelectric generators P0041 A82-10471 Effect of annealing Cds on a sintered Cds/Cu2S solar cell SIS (SENICOHOUCTORS) A new structure for a	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTEHNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DE81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] p0110 N82-12596 Kinetics of wet oxidation of biological sludges from coal-conversion wastewater treatment [DE82-000525] p0021 N82-12674 SLUBRIES Thermophysical properties of coal liquids [DE81-0279446] p0097 N82-10938 Transport characteristics of alternate slurry fuels [DE81-028580]
Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Eifects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells P0060 A82-17649 SILICOM MITRIDES High efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride P0058 A82-16127 SILVER ZINC BATTERIES Development of battery separator composites [NASA-CR-165508] P0157 N82-11547 SIMULATORS Solar heat pump simulator [DE81-024368] A sonic satellite power system microwave power transmission simulator P0147 B82-12548 SIMTERING Production of alloys of bismuth telluride for solar thermoelectric generators P041 A82-10471 Effect of annealing Cds on a sintered Cds/Cu2S solar cell P0051 A82-12820 SIS (SEMICOMDUCTORS) A new structure for a semiconductor solar cell p0057 A82-15911 SITE SELECTION Implementation of a siting methodology for utility	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 SLOT ANTENNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DE81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed combustion technology [DE82-001142] kinetics of wet oxidation of biological sludges from coal-conversion wastewater treatment [DE82-000525] p0021 N82-12574 SLUBRIES Thermophysical properties of coal liquids [DE81-0299446] p0097 N82-10938 Transport characteristics of alternate slurry fuels [DE81-028580] p0146 N82-11255 Solvent-Refined Coal (SRC) process [DE81-031937] Measurement of thermal conductivities in coal fluids [DE82-000523]
Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells p0060 A82-17649 SILICON HITRIDES Eigh efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride p0058 A82-16127 SILVER ZINC BATTERIES Development of battery separator composites [NASA-CR-165508] p0157 N82-11547 SIMULATORS Solar heat pump simulator [DE81-024368] p0070 N82-11583 A sonic satellite power system microwave power transmission simulator p0147 E82-12548 SINTERING Production of alloys of bismuth telluride for solar thermoelectric generators p0041 A82-10471 Effect of annealing Cds on a sintered Cds/Cu2S solar cell p0051 A82-12820 SIS (SENICONDUCTORS) A new structure for a semiconductor-insulator-semiconductor solar cell p0057 A82-15911	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 SLOT ANTENNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DE81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed conjustion technology [DE82-001142] p0110 N82-12596 Kinetics of wet oxidation of biological sludges from coal-conversion wastewater treatment [DE82-000525] p0021 N82-12674 SLURRIES Thermophysical properties of coal liquids [DE82-000525] p0196 N82-1297 Measurement of coal (SRC) process [DE81-028580] Solvent-Refined Coal (SRC) process [DE81-0290523] p0109 N82-1297 Measurement of thermal conductivities in coal fluids [DE82-000523] p0109 N82-12400 H-Coal product physical properties measurement [DE81-029095] p0111 N82-13245
Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells P0060 A82-17649 SILICON NITRIDES Bigh efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride P0058 A82-16127 SILVER ZINC BATTERIES Development of battery separator composites [NASA-CR-165508] p0157 N82-11547 SIMULATORS Solar heat pump simulator [DE81-024368] p0070 N82-11583 A sonic satellite power system microwave power transmission simulator P0147 N82-12548 SINTERING Production of alloys of bismuth telluride for solar thermoelectric generators P0041 A82-10471 Effect of annealing CdS on a sintered cdS/cu25 solar cell P0057 A82-15911 SITE SELECTIOH Implementation of a siting methodology for utility size WECS in western Massachusetts and	Advances in coal fired MHD generator research p0126 A82-11853 Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] p0138 N82-11173 Electrical effects of slag in a diffuse mode magnetonydrodynamic generator p0143 N82-13550 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680 SLOT ANTERNAS SPS antenna element evaluation p0148 N82-12555 Evaluation of thick wall wave guide element p0148 N82-12557 Method for precision forming of low-cost, thin-walled slotted waveguide arrays for the SPS p0148 N82-12558 SLUDGE Production and utilization of methane from anaerobic sludge digestion in U.S. wastewater-treatment plants [DB81-029958] p0101 N82-11246 Energy recovery from municipal solid waste and sewage sludge using multi-solid fluidized bed conbustion technology [DB82-001142] p0110 N82-12596 Kinetics of wet oxidation of biological sludges from coal-conversion wastewater treatment [DB82-000525] p0021 N82-12674 SLURRIES Thermophysical properties of coal liquids [DB81-0279446] p0097 N82-10938 Transport characteristics of alternate slurry fuels [DB81-028580] p0146 N82-11255 Solvent-Refined Coal (SRC) process [DB81-031937] Measurement of thermal conductivities in coal fluids [DB82-000523] p0109 N82-12400 H-Coal product physical properties measurement

SUBJECT INDEX SOLAR CELLS

SHELTING		Bounds and exact theories for the tra	ansport
Sulfur pollution control. Phase 1: 7	he disposal	properties of inhomogeneous media	p0056 A82-15607
	014 N82-11652	The El Paso electric 20-kilowatt pho-	
SOCIAL FACTORS		[AIAA PAPER 82-0064]	p0060 A82-17761
Pactors in the development of a major (fuels industry	S synthetic	The Mt. Laguna photovoltaic project [AIAA FAPER 82-0065]	p0061 A82-17762
	001 A82-11543	The Lea county electric 100-kilowatt	
Hear-term goals for alcohol fuels from		grid-connected photovoltaic system	
An overview of resource requirements, environmental, and socioeconomic impa		[AIAA PAPER 82-0067] Startup experience with a concentrat:	p0061 A82-17764
ethyl alcohol production		photovoltaic power system	
	0010 N82-11245	[AIAA PAPER 82-0068]	p0061 A82-17765
Energy analysis of human ecosystems in Appalachian coal county	an	Econopic analysis of the unified help [DE81-026698]	p0064 N82-10516
[DE81-025177] p(013 N82-11574	Intermediate photovoltaic-system app.	•
SODIUM CHLORIDES	1.	experiment operational performance	
Design and economics of direct-contact hydrate storage systems	Salt	Volume 1: For Lovington Square She site, Lovington, New Mexico	obbind center
[SERI/TP-631-1163] p(160 N82-15558	[DE81-028971]	p0065 N82-10543
SODIUM COOLING The design of a sodium-cccled 2.7 MW re	ceiver for	Solar cell development for the power package	extension
a solar power plant	scelver for	[NASA-TM-82685]	p0068 N82-11551
p(059 A82-17126	Mississippi County Community College	
SODIUM HYDROXIDES	anle	photovoltaic project [DB81-030669]	p0068 N82-11554
Laboratory study for removal of organic from coal	, sullul	System performance conclusions	p0000 B02 11354
[DE81-025132] p(0010 N82-11239		p0146 N82-12539
SODIUM IODIDES Photoelectrochemical behaviour of CdS/	CURE C Tel	SPS large array simulation	p0071 N82-12540
/liquid sodium iodide ammoniate/ junc		An active alignment scheme for the M	
Utilization in solar energy conversion	n		p0147 N82-12541
SODIUM SULPUR BATTERIES	0051 A82-12822	Design and breadboard evaluation of reference phase control system con-	
Recent progress on the development of	he Dow	reservance paulic coactor offices cos.	p0072 N82-12545
hollow fiber sodium-sulfur battery	400 -00 44555	Ionospheric effects in active retrod	irective array
Small sodium sulfur battery for solar a)123 A82-11777 and wind	and mitigating system design	p0147 N82-12551
energy systems		Space applicable DOE photovoltaic te	
	0047 A82-11778	update	-0076 NO2-42804
SOILS Investigation of direct expansion in grant of the state of the s	cound source	[NASA-CR-165021] Inexpensive thermographic techniques	p0076 N82-13491 for
heat pumps		determining reliable solar-collect	
[DE81-024139] pt Geothermal environmental assessment: 1	0012 N82-11418	performance [DE82-001151]	p0076 N82-13528
selected geothermal brine contaminant		Data report for the northeast reside	
and soils	-	experiment station, June 1981	photovoltaic
[PB81-222333] pt	0015 N82-11671	systems [DE82-000068]	p0077 N82-13533
Boiling flow instability of a fixed min	ror	Flat-plate solar array project. Tas	
distributed focus solar receiver	2014 200 40340	material: Investigation of the	
The contoured-oxide monclithic series-	0041 A82-10810 Array solar	hydrochiorination of SiC1sub4 [NASA-CR-165042]	p0078 N82-14631
battery	-	Study of multi-megawatt technology n	eeds for
	0042,A82-11190	photovoltaic space power systems. Executive summary	Volume 1:
Cascade photogenerators based on silicon germanium matrix photocchverters	on and	[NASA-CR-165323-VOL-1]	p0078 N82-14636
P	0044 A82-11422		
Combined solar-energy converters with		Solar power systems smaller than 500	
coatings		military use	W for
coatings p	selective	military use [PHL-1980~06] SOLAR BLANKETS	W for p0080 N82-15534
pi High power solar array switching regula	selective 0044 A82-11424 ation	military use [FML-1980-06] SOLAR BLANKETS Cost and performance projections for	W for p0080 N82-15534
pi High power solar array switching regula	selective 0044	military use [PHL-1980~06] SOLAR BLANKETS	W for p0080 N82-15534
po Bigh power solar array switching regule po Bigh performance silıcon sclar arrays o advanced structures	selective 0044 A82-11424 ation 0045 A82-11736 amploying	military use [PHL-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array	W for p0080 N82-15534 SPS p0045 A82-11741
Bigh power solar array switching regula pl High performance silicon solar arrays of advanced structures	selective 0044 A82-11424 ation 0045 A82-11736 amploying 0045 A82-11758	military use [FMI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets	W for p0080 N82-15534 SPS p0045 A82-11741 s.employing
Bigh power solar array switching regular power solar array switching regular programmers advanced structures py Solar panel current degradation factors	selective 0044 A82-11424 ation 0045 A82-11736 amploying 0045 A82-11758	military use [PHL-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array	W for p0080 N82-15534 SPS p0045 A82-11741
Bigh power solar array switching regule High performance silicon solar arrays of advanced structures possible panel current degradation factors possible panel concentrators for photovolte	selective 0044 A82-11424 ation 0045 A82-11736 employing 0045 A82-11758 s 0045 A82-11759	military use [PHL-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Phys	W for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758
Bigh power solar array switching regular power solar array switching regular power solar arrays of advanced structures Solar panel current degradation factor: Nonimaging concentrators for photovoltain space	selective 0044 A82-11424 ation 0045 A82-11736 amploying 0045 A82-11758 s 0045 A82-11759 aic arrays	military use [PMI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS	W for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials
Bigh power solar array switching regule High performance silicon solar arrays advanced structures Solar panel current degradation factors plus space The evaluation of four solar-array-powers	selective 0044 A82-11424 ation 0045 A82-11736 employing 0045 A82-11758 s 0045 A82-11759 aic arrays	military use [PHL-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Phys	W for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022
Bigh power solar array switching regule High performance silicon solar arrays of advanced structures Solar panel current degradation factors Nonimaging concentrators for photovolte in space The evaluation of four solar-array-powe multi-kw power conditioners for Space	selective 0044 A82-11424 ation 0045 A82-11736 employing 0045 A82-11758 s 0045 A82-11759 aic arrays	military use [FHI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Physiand technology Research and device problems in phot	W for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023
Bigh power solar array switching regular properties of the evaluation of four solar array-power orbiter application.	Selective 0044 A82-11424 ation 0045 A82-11736 comploying 0045 A82-11758 comploying 0045 A82-11759 comploying 0046 A82-11761 comploying 0046 A82-11761	military use [PHI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Physicand technology	W for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023
Bigh power solar array switching regular sign performance silicon solar arrays advanced structures Solar panel current degradation factors performance silicon solar arrays of photovoltar and space The evaluation of four solar-array-power multi-kw power conditioners for Space orbiter application The design of series-parallel connected	Selective 0044 A82-11424 ation 0045 A82-11736 employing 0045 A82-11758 s 0045 A82-11759 aic arrays 0046 A82-11761 ered e Shuttle 0046 A82-11772	military use [FHI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Physiand technology Research and device problems in phot	# for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023 cells p0039 A82-10024 devices
Bigh power solar array switching regule High performance silicon solar arrays of advanced structures Solar panel current degradation factors Nonimaging concentrators for photovolta in space The evaluation of four solar-array-power multi-kW power conditioners for Space Orbiter application The design of series-parallel connected converter arrays	Selective 0044 A82-11424 ation 0045 A82-11736 mploying 0045 A82-11758 0045 A82-11759 aic arrays 0046 A82-11761 ered ered oreshuttle 0046 A82-11772 orenical thermionic	military use [FMI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Physiand technology Research and device problems in phot Heterojunctions for thin film solar. The optimization of solar conversion	# for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023 cells p0039 A82-10024 devices p0039 A82-10025
Bigh power solar array switching regule High performance silicon solar arrays of advanced structures Solar panel current degradation factors Nonimaging concentrators for photovolta in space The evaluation of four solar-array-power multi-kW power conditioners for Space Orbiter application The design of series-parallel connected converter arrays	Selective 0044 A82-11424 ation 0045 A82-11736 amploying 0045 A82-11758 S 0045 A82-11759 aic arrays 0046 A82-11761 ared a Shuttle 0046 A82-11772 1 thermionic 0124 A82-11820	military use [PHI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Physand technology Research and device problems in phot	# for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023 cells p0039 A82-10024 devices p0039 A82-10025
Bigh power solar array switching regular distriction solar arrays advanced structures Solar panel current degradation factor: Nonimaging concentrators for photovoltain space The evaluation of four solar-array-power multi-kw power conditioners for Space Orbiter application The design of series-parallel connected converter arrays 'Thin foil cells - A challenge for space designers'	Selective 0044 A82-11424 ation 0045 A82-11736 employing 0045 A82-11758 S 0045 A82-11759 aic arrays 0046 A82-11761 ered e Shuttle 0046 A82-11772 d thermionic 0124 A82-11820 Ge array	military use [PHI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Phys and technology Research and device problems in phot Heterojunctions for thin film solar The optimization of solar conversion Some characteristics of silicon phot fabricated by planar technology	# for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023 cells p0039 A82-10024 devices p0039 A82-10025 ocells p0039 A82-10025
Bigh power solar array switching regular High performance silicon solar arrays advanced structures Solar panel current degradation factors Nonimaging concentrators for photovolta in space The evaluation of four solar-array-powe multi-kW power conditioners for Space Orbiter application The design of series-parallel connected converter arrays 'Thin foll cells - A challenge for space designers'	Selective 0044 A82-11424 ation 0045 A82-11736 amploying 0045 A82-11758 s 0045 A82-11759 aic arrays 0046 A82-11761 ared a Shuttle 0046 A82-11772 1 thermionic 0124 A82-11820 Ge array 0049 A82-11842	military use [FMI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Phys and technology Research and device problems in phot Heterojunctions for thin film solar The optimization of solar conversion Some characteristics of silicon phot fabricated by planar technology Present state of research on selecti	# for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023 cells p0039 A82-10024 devices p0039 A82-10025 ocells p0039 A82-10025
Bigh power solar array switching regular distriction solar arrays advanced structures Solar panel current degradation factor: Nonimaging concentrators for photovoltain space The evaluation of four solar-array-power multi-kw power conditioners for Space Orbiter application The design of series-parallel connected converter arrays 'Thin foil cells - A challenge for space designers'	Selective 0044 A82-11424 ation 0045 A82-11736 amploying 0045 A82-11758 s 0045 A82-11759 aic arrays 0046 A82-11761 ared a Shuttle 0046 A82-11772 1 thermionic 0124 A82-11820 Ge array 0049 A82-11842	military use [PHI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Phys and technology Research and device problems in phot Heterojunctions for thin film solar The optimization of solar conversion Some characteristics of silicon phot fabricated by planar technology	# for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023 cells p0039 A82-10024 devices p0039 A82-10025 ocells p0039 A82-10025
Bigh power solar array switching regule High performance silicon solar arrays advanced structures Solar panel current degradation factors Nonimaging concentrators for photovoltatin space The evaluation of four solar-array-powe multi-kW power conditioners for Space Orbiter application The design of series-parallel connected converter arrays 'Thin foil cells - A challenge for space designers' Progress in large area photovoltaic defon amorphous silicon alloys	Selective 0044 A82-11424 ation 0045 A82-11736 amploying 0045 A82-11758 5 0045 A82-11759 aic arrays 0046 A82-11761 ared a Shuttle 0046 A82-11772 d thermionic 0124 A82-11820 ce array 0049 A82-11842 vices based	military use [FHI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Phys and technology Research and device problems in phot Heterojunctions for thin film solar The optimization of solar conversion Some characteristics of silicon phot fabricated by planar technology Present state of research on selectifor solar-energy converters Numerical simulation of solar cell o	# for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023 cells p0039 A82-10024 devices p0039 A82-10025 ocells p0039 A82-10386 ve coatings p0039 A82-10387
Bigh power solar array switching regular High performance silicon solar arrays advanced structures Solar panel current degradation factors Nonimaging concentrators for photovolts in space The evaluation of four solar-array-power multi-kw power conditioners for Space Orbiter application The design of series-parallel connected converter arrays 'Thin foil cells - A challenge for space designers' Progress in large area photovoltaic desonation amorphous silicon alloys	Selective 0044 A82-11424 ation 0045 A82-11736 amploying 0045 A82-11758 5 0045 A82-11759 aic arrays 0046 A82-11761 ared a Shuttle 0046 A82-11772 d thermionic 0124 A82-11820 ce array 0049 A82-11842 vices based	military use [PHI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Phys. and technology Research and device problems in phot Heterojunctions for thin film solar. The optimization of solar conversion Some characteristics of silicon phot fabricated by planar technology Present state of research on selectifor solar-energy converters	# for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023 cells p0039 A82-10024 devices p0039 A82-10025 ocells p0039 A82-10386 ve coatings p0039 A82-10387
High power solar array switching regular High performance silicon solar arrays advanced structures Solar panel current degradation factor: Nonimaging concentrators for photovoltation space The evaluation of four solar-array-power multi-kw power conditioners for Space Orbiter application The design of series-parallel connected converter arrays 'Thin foil cells - A challenge for space designers' Progress in large area photovoltaic designers in large area photovoltaic designers arrays A technological approach towards future solar arrays	Selective 0044 A82-11424 ation 0045 A82-11736 amploying 0045 A82-11758 5 0045 A82-11759 aic arrays 0046 A82-11761 ared a Shuttle 0046 A82-11772 d thermionic 0124 A82-11820 ce array 0049 A82-11842 vices based	military use [FHI-1980-06] SOLAR BLANKETS Cost and performance projections for photovoltaic blankets High performance silicon solar array advanced structures SOLAR CELLS Introduction to photovoltaics - Phys and technology Research and device problems in phot Heterojunctions for thin film solar The optimization of solar conversion Some characteristics of silicon phot fabricated by planar technology Present state of research on selectifor solar-energy converters Numerical simulation of solar cell o	# for p0080 N82-15534 SPS p0045 A82-11741 s.employing p0045 A82-11758 ics, materials p0038 A82-10022 ovoltaics p0039 A82-10023 cells p0039 A82-10024 devices p0039 A82-10025 ocells p0039 A82-10386 ve coatings p0039 A82-10387 pen circuit p0041 A82-10658

p0041 A82-10776

SOLAR CELLS CONTD SUBJECT INDEX

Carrier-collection efficiencies in amorphous Temperature dependence of the short-circuit hydrogenated silicon Schottky-barrier solar cells current in MIS solar cells p0042 A82-11185 D0052 A82-12825 Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells Oxide optimization at the p-Si/aqueous electrolyte interface p0042 A82-11187 p0052 A82-13199 Vertical solar cell and internal electric field Thin-film gallium arsenide homojunction solar cells p0042 A82-11189 p0052 A82-13200 The contoured-oxide monolithic series-array solar Investigation of the possibility of using inexpensive concentrating systems in the modules battery p0042 A82-11190 of a photoelectric station p0052 A82-13713 Plutonium thermochemical sclar cell p0043 A82-11215 Production and certain properties of photoelectric Investigations of the OCVD transients in solar cells cells based on silicon epitarial structures p0053 A82-13716 --- Open Circuit Voltage Decay A new low temperature III-V multilayer growth p0043 A82-11334 Stability of n-i-p amorphous silicon solar cells p0043 A62-11343 technique - Vacuum metalorganic chemical vapor deposition --- of Gals thin films Efficient Si solar cells by low-temperature p0053 A82-13803 Dependence of minority carrier diffusion length on solid-phase epitaxy p0043 A82-11344 illumination level and temperature in single crystal and polycrystalline Si solar cells Cascade photogenerators based on silicon and p0053 A82-13804 germanium matrix photoconverters Investigation of the performance of an MoS2/I-/I2/C electrochemical solar cell p0044 A82-11422 Combined solar-energy converters with selective p0053 A82-13805 coatings p0044 A82-11424 Low frequency capacitance characterizations on indium/x-phase of metal free phtnalocyanine Solar panel current degradation factors p0045 A82-11759 solar cells p0053 A82-13806 High- and low-resistivity silicon solar cells Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 D0046 A82-11762 Solar cell development for the Power Extension Package Silicon and gallium arsenide photovoltaic cells p0046 A82-11763 models for the functioning, experimentation, and Thin cells - Their present status and future areas application to concentrating collectors --of development French thesis p0046 A82-11764 D0055 A82-15006 Gallium arsenide sclar cells-status and prospects Sputtered thin film electrodes for for use in space photoelectrochemical cells D0046 A82-11765 p0055 A82-15111 GaAs solar cells for space application Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0046 A82-11766 High efficiency thin-film GaAs solar cells p0055 A82-15112 p0046 A82-11767 An analytical model for high-low-emitter /HLE/ The Texas Instruments Sclar Energy System solar cells in concentrated sunlight p0055 A82-15441 development p0047 A82-11773 A punhole model for metal-insulator-semiconductor Advances in photovoltaics R&D - An overview solar cells p0047 A82-11793 p0056 A82-15442 The development of high efficiency cascade solar Effect of junction depth on the performance of a cells - An overview diffused n/+/p silicon solar cell p0047 A82-11794 p0056 A82-15444 Research activities of sclar cells in ROC Theory of back surface field silicon solar cells p0047 A82-11795 p0056 A82-15447 Multijunction high voltage concentrator solar cells A new structure for a p0047 A82-11796 semiconductor-insulator-semiconductor solar cell p0057 A82-15911 Advanced Satellite Power System /SFS/ concept p0049 A82-11839 Grain size dependence of the photovoltaic properties of solar grade polysilicon Thin foil cells - A challenge for space array designers' p0057 A82-16051 p0049 A82-11842 High efficiency inversion layer solar cells on Methods and problems of industrial-scale electric polycrystalline silicon by the application of power generation from sclar energy silicon nitride p0050 A82-12506 p0058 A82-16127 A numerical model of a graded band gap A method for experimental assessment of the CdS/x/Te/1-x/ solar cell shifting approximation, with application to p0050 A82-12817 polysilicon solar cells --- effect of constant Preparation and properties cf graded band gap CdS/x/Te/1-x/ thin film solar cells series resistance p0058 182-16131 p0051 A82-12818 K/u/-band flat-profile S1-IMPATT dlodes with Series resistance effects in 20 sq cm indium tin 10-percent efficiency oxide-polycrystalline silicon solar cells p0058 A82-16132 p0051 A82-12819 Influence of the junction area to edge area ratio Effect of annealing CdS on a sintered CdS/Cu2S on the open-circuit voltage of silicon solar cells p0058 A82-16133 solar cell p0051 A82-12820 Effects of heat treatment on epitaxial silicon ZnO - p-InP heterojunction solar cells solar cells on metallurgical silicon substrates p0051 A82-12821 p0058 A82-16469 Photoelectrochemical behaviour of Cds/NaI.3.3NH3 n-/indium tin oxide//p-InP solar cells p0058 A82-16471 /liquid sodium iodide ammoniate/ junctions -Utilization in solar energy conversion Effects of double-exponential current-voltage p0051 A82-12822 characteristics on the performance of solar cells A practical method of analysis of the p0058 A82-16472

Effects of processing parameters on thick film

inks used for solar cell front metallization

Low cost silicon-on-ceramic photovoltaic solar cells p0059 182-17098

p0058 A82-16474

current-voltage characteristics of solar cells

V205-Si photovoltaic cells

p0051 A82-12823

p0051 A82-12824

SUBJECT INDEX SOLAR COLLECTORS

A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar cells D0060 A82-17649 Field nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 Effects of low temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells p0061 A82-18287 Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 Thin-film polycrystalline cadmium telluride solar cells and large-area polycrystalline silicon solar cells p0062 N82-10490 Thin film photovoltaic devices p0063 N82-10491 Silicon solar cell process development, fabrication and analysis [NASA-CR-163787] p0 p0063 N82-10500 Optimization of transparent electrode for solar cells [DE81-023359] D0063 N82-10507 Investigation of photovoltaic mechanisms in polycrystalline thin-film solar cells [DE81-027272] p0065 N82-10539 Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 Automated Fresnel lens tester system [DE81-029483] p0066 N82-10863 The effects of impurities on the performance of silicon solar cells [NASA-CR-164945] p0067 N82-Solar cell development for the power extension p0067 N82-11548 package [NASA-TM-82685] P0068 N82-11551 Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells [DB81-027234] p0068 N82-11557 Amorphous boron-silicon-hydrogen alleys for thin-film heterojunction solar cells [DE81-027254] p0068 N82-11558 Impurity effects in a-Si:H solar cells [DE81-025069] p0069 N82-11575 Zn3P2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] p0069 N82-11577 National photovoltaic program in amorphous materials [DE81-025906] p0070 N82-11609 p0070 N82-11609 Intermediate photovoltaic system application experiment operational performance: Executive summary. Volume 1: For Newman Fower Station, El Paso, Texas [DB81-031934] p0072 N82-12602 Photovoltaic mechanisms in polycrystalline thin film sılicon solar cells [DE81-030370] p0072 N82-12608 Distributed photovoltaic systems: Utility interface issues and their present status [NASA-CR-165019] p0076 N82-13492 High resolution, low cost solar cell contact development [NASA-CR-165032] p0076 N82-13501 Silicon solar cell optimization [AD-A106005] p0076 N82-13514 Development of an all-metal thick film cost effective metallization system for solar cells
[NASA-CR-165043] p0078 N82-14630 Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management
[NASA-TM-58237-VOL-4] p0078 NS
Study of multi-megawatt technology needs for p0078 N82-14634 photovoltaic space power systems. Volume 1: Executive summary [NASA-CR-165323-VOL-1] p0078 N82-14636 REPEAT facility. Report for May, June, July [DE81-028156] p0079 N p0079 N82-14665 Photoelectrochemical sclar cells: Stabilization of small-band-gap semiconductor in aqueous solution by surface-attached organic conducting

p0081 N82-15569

polymer

[DE81-030312]

Verification of BLAST by comparison with measurements of a solar-dominated test cell and a thermally massive building [DE81-029883] p0082 N82-15578 SOLAR COLLECTORS Solar mirror materials - Their properties and uses in solar concentrating collectors p0037 A82-10012 The effect of soiling on solar mirrors and techniques used to maintain high reflectivity p0037 A82-10013 The emissivity of metals --- frequency and temperature dependence calculations for solar collector design p0038 A82-10014 Corrosion science and its application to solar thermal energy material problems D0038 A82-10017 Research and device problems in photovoltaics p0039 A82-10023 Investigation of abrasive action of atmospheric particles on the reflectance of mirrors p0040 A82-10388 Experimental investigation of parabolic-cylinder solar concentration with tubular heat receiver p0040 A82-10389 Spectrally selective copper sulphide coatings p0040 A82-10468 Production of alloys of bismuth telluride for solar thermoelectric generators D0041 A82-10471 Boiling flow instability of a fixed mirror distributed focus solar receiver p0041 A82-10810 Optical degradation of antireflective silica film on solar collector windows p0041 A82-10836 AAI Corporation receiver design experience in concentrating solar collectors p0041 A82-10969 [ASME PAPER 81-SOL-1] Development of a solar thermal central heat receiver using molten salt [ASME PAPER 81-SOL-2] p0041 A82-10970 Testing of the U.S. Solar Palot Plant receiver [ASME PAPER 81-SOL-3] p0041 A82-10971 The development and design of steam/water solar receivers for commercial application
[ASME PAPER 81-SOL-4] p0042 A82-1097
Conceptual design of an advanced water/steam
receiver for a solar thermal central power system p0042 A82-10972 [ASME PAPER 81-SOL-5] p0042 A82-10973 Simple tracking strategies for solar concentrations p0042 A82-11207 Design and testing of a uniformly illuminating nontracking concentrator p0042 A82-11209 Focal plane flux distributions produced by solar concentrating reflectors p0043 A82-11211 The effect of inclination on the heat loss from flat-plate solar collectors p0043 A82-11212 Efficiency of Fresnel lenses p0043 A82-11387 Geometrical optical performance studies of a composite parabolic trough with a fin receiver p0043 A82-11390 Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 Efficiency of selective surfaces for solar thermal collectors p0044 A82-11425 A spacecraft thermophotovoltaic power source with thermal storage p0044 A82-11711 Nonimaging concentrators for photovoltaic arrays in space Ground-mounted thermal storage for the parabolic dish solar collector/Stirling engine system p0047 A82-11781 Secondary concentrators for parabolic dish solar thermal power systems p0048 A82-11798 The effect of concentrator field layout on the EE-1 small community solar power system

p0048 A82-11799

Optimization of heat losses in normal and reverse Development of a solar receiver for an organic Rankine cycle engine flat-plate collector configurations - Analysis D0048 A82-11800 and performance Control system development for a 1 MW/e/ solar p0059 A82-16744 thermal power plant The design of a sodium-cooled 2.7 MW receiver for p0048 A82-11801 a solar power plant Dynamic performance analysis for the solar hybrid p0059 A82-17126 repowering of the Bl Paso Electric Company Solar-thermal experimental projects on the Spanish Newman Unit No. 1 Plataforma Solar p0048 A82-11802 p0059 A82-17128 A thermoelectric refrigerator powered by Aplanatic double reflection system for photovoltaic solar collectors thermophotovoltaic applications - Design p0049 A82-11858 p0060 A82-17293 The effect of variable fluid properties on scale Finite Lambertian source analysis of concentrators modeling --- of solar central receivers Application to solar reflectors p0049 A82-12269 p0060 A82-17294 Theoretical analysis of the performance of a Startup experience with a concentrating gravity-controlled sclar concentrator photovoltaic power system p0050 A82-12812 [AIAA PAPER 82-0068] p0061 A82-17765 High-temperature solar central receivers High performance solar Stirling system p0052 A82-12949 p0061 A82-18222 [AIAA PAPER 81-2554] Chromatic aberration effect on solar energy Configuration selection study for isolated loads using parabolic dish modules
[AIAA PAPER 81-2549] p0061
Thermal deformation of concentrators in an systems using Presnel lenses p0061 A82-18223 p0052 A82-13284 Luminescent solar concentrators. II - Experimental and theoretical analysis of their possible antisymmetric temperature field efficiencies p0062 A82-18698 P0052 A82-13285 A simplified model of the thermohydraulic Investigation of the possibility of using behaviour of a linear collector network for the conversion of the solar energy inexpensive concentrating systems in the modules of a photoelectric station p0062 A82-18816 p0052 A82-13713 An analytical comparison of the efficiency of Analysis of the optical characteristics of solar solar thermal collector arrays with and without external manifolds [NASA-CR-161852] collectors p0052 A82-13715 p0063 N82-10501 Performance evaluation of the solar kinetics T-700 Mathematical simulation model for the operation of the optical system of a sclar power station line concentrating solar collector [NASA-CR-161856] p0063 N82-10502 p0053 A82-13718 Buffer thermal energy storage for a solar Brayton Evaluation of All-Day-Efficiency for selected flat engine plate and evacuated tube collectors [AIAA PAPER 81-2531] [NASA-CR-161866] p0063 N82-10504 Solar project description for Public Service [AĨAA PAPER 81-2531] p0053 A82-14002 Development, solar test, and evaluation of a Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico high-temperature air receiver for point-focusing parabolic dish applications AIAA PAPER 81-2532] p0053 A82-14003 [DE81-027853] Solar concentrator panel and gore testing in the JPL 25-foot space simulator Prequency response analysis of fluid control systems for parabolic-trough solar collectors p0054 A82-14005 [DE81-029293] p0064 No Integrated function nonimaging concentrating [AIAA PAPER 81-2534] p0064 N82-10513 Use of ceramics in point-focus solar receivers p0054 A82-14015 [AIAA PAPER 81-2552] collector tubes for solar thermal energy p0064 N82-10521 A simplified method for direct calculation of the [DB81-029677] Solar energy system design: A simple method for sizing the collector field and thermal storage [DB81-028852] p0065 N82-10541 annual load fraction of solar systems for space heating P0054 A82-14405 Thermal analysis of three zone solar pond Conceptual design of a glass-reinforced concrete P0054 A82-14406 solar collector [DE81-029280] p0065 N82-10542 Optimization of flow passage geometry for air-heating, plate-type solar collectors Application of solar thermal energy to buildings p0055 A82-14846 and industry
[SERI/TP-641-1222] Silicon and gallium arsenide photovoltaic cells . p0066 N82-10563 Models for the functioning, experimentation, and The young solar collector: An evaluation of its application to concentrating collectors -multiple farm uses [PB81-214132] French thesis p0066 N82-10577 p0055 A82-15006 Automated Presnel lens tester system [DB81-029483] p0066 N82-10863 Colloidally deposited high-temperature solar Practure mechanics of cellular glass selective surfaces P0055 A82-15439 [NASA-CR-164959] p0066 N82-11209 Calculation of the top loss coefficient by the Irrigation market for solar thermal parabolic dish network method and applications to solar systems p0068 N82-11549 collectors [NASA-CR-164955] Secondary and compound concentrators for parabolic p0056 A82-15653 A solar heating system with annual storage dish solar thermal power systems p0056 A82-15666 [NASA-CA-164960] D0068 N82-11550 Towards a high-temperature solar electric converter Solar energy system performance evaluation: p0056 A82-15903 Porest City Dillon, Washington, D.C., January 1980 - December 1980 Sputter etched metal solar selective absorbing [DE81-028174] surfaces for high temperature thermal collectors p0068 N82-11560 Solar energy system performance evaluation: Boncecito Pines, Santa Bosa, California, Bovember 1979 - April 1980 p0057 A82-16057 Natural convection in air layers at various aspect ratios and angles of inclination D0058 A82-16249 [DE81-028175] p0068 N82-11561 A seasonally adjusted concentrator with Design, cost and performance comparisons of several solar thermal systems for process heat. modifications of absorber shape p0059 A82-16598 Volume 1: Executive summary [DB81-029881] Theoretical analysis of the Presnel lens as a p0069 #82-11576 function of design parameters --- for solar Low-cost solar flat-plate-collector development concentrators [DE81-025081] p0070 N82-11584 Controls for solar heating and cooling p0059 A82-16599 p0070 N82-11593 [DE81-025209]

SUBJECT INDEX SOLAR ENERGY

Test results and analysis of a convective loop	Annual DOB Active Solar Heating and Cooling
solar air collector [DB81-028151] p0070 B82-11599	Contractors Review meeting [DEd1-028052] p0081 N82-15572
Performance testing of the TOLTEC TI-410	Verification of BLAST by comparison with
concentrating solar collector	measurements of a solar-dominated test cell and
[DR81-029994] p0071 #82-11617 The Rogers focusing heliostat experimental program	a thermally massive building [DE01-029803] p0082 N02-15570
at Rensselaer Polytechnic Institute	Supplement to energy for rural development:
[PB81-226813] p0071 N82-11625	Renewable resources and alternative technologies
Guidebook for solar process-heat applications	for developing countries
[DB81-027977] p0072 N82-12598 Cost goals for a residential photovoltaic/thermal	[PB81-231011] p0032 882-15592 SOLAR ELECTRIC PROPULSION
liquid collector system set in three northern	The evaluation of four solar-array-powered
locations	multi-kW power conditioners for Space Shuttle'
[DE81-029700] p0073 N82-12610 Near-term improvements in parabolic troughs: An	Orbiter application p0046 A82-11772
economic and performance assessment	SOLAR BHERGY
[DB82-001158] p0073 N82-12615	Peasibility of solar assisted ethanol production
Improvement of thermal efficiency of flat plate	[AIAA PAPER 81-2533] p0054 A82-14004 Solar thermal cost goals - Implementing a
Solar collectors [BMFT-FB-T-80-194] p0075 N82-12642	methodology for assessing break-even value and
Bnvironmental data for sites in the National Solar	market potential
Data Network	[AIAA PAPER 81-2550]
[DE82-000071] p0075 N82-12707 Dish stirling solar receiver combustor test program	A method for preliminary evaluation and sizing of solar thermal cogeneration system applications
[NASA-CR-165017] p0076 N82-13495	[AIAA PAPER 81-2551] p0054 A82-14014
Inexpensive thermographic techniques for	The significance of hydrogen as future secondary
determining reliable sclar-collector-array performance	energy carrier p0146 A82-17127
[DB82-001151] p0076 N82-13528	Theoretical and numerical resolution of a
Solar-central-receiver fuels and chemicals	mathematical model of the release of solar
[DB82-000941] p0077 B82-13530 SOLTECH 80	energy from storage p0061 182-18232
[DB81-901931] p0079 N82-14643	Solar energy modulator
Solar Photovoltaic Residential Project. Project	[NASA-CASE-NPO-15388-1] p0063 N82-10496
Integration Meeting, Agenda and Abstracts [DE81-028433] p0079 N82-14657	<pre>Energy end-use requirements in manufacturing, volume 1</pre>
[DE81-028433] p0079 N82-14657 Dimensions, volume 65, number 3	[DE81-028975] p0064 N82-10512
[PB81-235053] p0161 N82-15436	Cooperative program of applied energy research
High efficient collector for small sclar-powered facilities	technology development [DE81-028916] p0007 N82-10517
[BMFT-FB-T-81-156] p0080 N82-15538	Standards application and development plan for
Low-cost mirror concentrator based on inflated,	solar thermal technologies
double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551	[DE81-030310] p0065 H82-10534 Solar photovoltaic system engineering perspectives
Annual DOB Active Solar Heating and Cooling	[DE81-023179] p0066 N82-10570
Contractors Review meeting	The young solar collector: An evaluation of its multiple farm uses
[DE81-028052] p0081 M82-15572 SOLAR CONSTANT	[PB81-214132] p0066 N82-10577
Automated Presnel lens tester system	Solar data base management system
[DE81-029483] p0066 N82-10863 SOLAR COOLING	[DB81-023122] p0066 B82-10952 Solar coal-gasification reactor for
The application of reversible chemical reactions	hydrocarbon-free synthesis gas
to solar thermal energy systems p0038 A82-10020	[DE81-026600] p0067 N82-11247 Parametric sensitivity study for solar-assisted
Alternative power sources for residential	heat-pump systems
air-conditioning systems	[DE81-030309] p0067 N82-11407
p0039 A82-10331 A thermoelectric refrigerator powered by	Irrigation market for solar thermal parabolic dish systems
photovoltaic solar collectors	[NASA-CR-164955] p0068 N82-11549
p0049 A82-11858	Use of solar thermal energy to generate electricity
Method for calculating the unsteady temperature conditions of the generator in a solar	[DE81-028797] p0070 N82-11606 An assessment of selected solar energy industry
refrigeration system	activities
p0056 A82-15642	[PB81-222424] p0071 #82-11623 Comparison of residential window distributions and
Solar project description for Colorado Sunworks: Single family	effects of mass and insulation
[DE81-028054] P0064 N82-10510	[DE81-027938] p0017 N82-12283
Controls for solar heating and cooling [DE81-025209] p0070 N82-11593	Status of solar energy research and development in Australia "
Solar Heating And Cooling Of Buildings (SHACOB):	[NP-1903916] p0073 N82-12611
Requirements definition and impact analysis-2.	Solar Energy Information Data Bank (SEIDB)
Volume 1: Energy-conserving design for residential structures	program, FY 1981 [DE81-030054] p0073 N82-12612
[DB82-900206] p0017 N82-12278	Solar thermal central receivers for industrial
Solar Heating And Cooling Of Buildings (SHACOB):	process heat generation: User views and
Requirements definition and impact analysis-2. Volume 3: Customer load management systems	recommendations for commercialization [DE81-029611] p0073 M82-12618
[DB82-900208] p0071 N82-12280	Plexibilities in passive design: Examining some
Optimization of solar heating and cooling systems	limiting solar myths [DE81-028401] p0073 N82-12623
[NP-1903997] p0072 N82-12599 Performance predictions of passive solar	[DE81-028401] p0073 N82-12623 Seasonal performance factors for active solar
conmercial buildings	systems and heat-pump systems
[DR81-027979] p0079 M82-15247 Low-cost passive-solar retrofits for new and	[DB81-028569] p0074 N82-12625 Solar explosion
existing mobile homes	[DE81-026086] p0074 N82-12628
[DB81-028356] p0081 N82-15544	Passive-solar-retrofit study for the United States
	Navy [DE81-028921] p0074 N82-12629
	-

SOLAR EMERGY ABSORBERS SUBJECT INDEX

Department of Energy Solar Central Receiver	Optical properties of selectively absorbing
Semiannual Meeting	chromium films deposited at oblique angle of
[SAND-80-8049] p0074 N82-12632	incidence
Energy technologies and the environment.	p0040 A82-10467
Environmental information handbook	Effect of metal base layer on the absorptance and
[DE81-029809] p0020 N82-12660	emittance of sputtered graded metal-carbon
Inexpensive thermographic techniques for	selective absorbing surfaces
determining reliable solar-collector-array	p0040 A82-10469
performance	Solution grown PbS/CdS multilayer stacks as
[DE82-001151] , p0076 N82-13528	selective absorbers
	p0041 A82-10472
Solar-central-receiver fuels and chemicals	
[DE82-000941] p0077 N82-13530	Calculation of the top loss coefficient by the
Intermediate photovoltaic system application	network method and applications to solar
 experiment operational performance report. 	collectors
Volume 2 for Beverly High School, Beverly, Mass.	p0056 A82-15653
[DE82-000811] p0077 N82-13532	Solar selective properties and high temperature
Passive/hybrid solar components: An approach to	stability of CVD ZrB2
standard thermal test methods	p0057 A82-16055
[PB81-227886] p0077 N82-13549	Sputter etched metal solar selective absorbing
Fuels and chemicals made from solar energy	surfaces for high temperature thermal collectors
[DE81-025018] p0077 N82-14384	p0057 A82-16057
Study of multi-megawatt technology needs for	An integrating sphere based on absolute method for
photovoltaic space power systems. Volume 1:	measuring solar absorptance
Executive summary	p0058 A82-16247
[NASA-CR-165323-VOL-1] p0078 N82-14636	A seasonally adjusted concentrator with
Study of multi-megawatt technology needs for	modifications of absorber shape
photovoltaic space power systems, volume 2	p0059 A82-16598
[NASA-CR-165323-VOL-2] p0078 N82-14637	Nickel sulphide-lead sulphide and nickel
Seminars for private college administrators on	sulphide-cadmium sulphide selective coatings for
solar applications for college buildings	solar thermal conversion
[DE81-027981] p0079 N82-14661	p0059 A82-16745
	· · · · · · · · · · · · · · · · · · ·
Performance predictions of passive solar	Metallurgical analysis and high temperature
connercial buildings	degradation of the black chrome solar selective
[DE81-027979] p0079 N82-15247	absorber
High efficient collector for small sclar-powered	p0060 A82-17252
facilities	Sputter-deposited Al203/Ho/Al203 selective
[BMFT-PB-T-81-156] p0080 N82-15538	absorber coatings
Comparison of concepts for solar-heated or	p0060 A82-17253
	· · · · · · · · · · · · · · · · · · ·
solar-driven absorption and compression cooling	Characterization of selective solar absorber
machines for air conditioning and food	microstructures - Electron microscope studies
preservation purposes, phase 1	p0060 A82-17254
[BMFT-FB-T-81-165] p0080 N82-15541	Oxidation of electrodeposited black chrome
Low-cost passive-solar retrofits for new and	selective solar absorber films
	p0060 A82-17255
existing mobile homes	
[DE81-028356] p0081 N82-15544	Aging and corrosion problems with flat solar
Industrial process heat applications for solar	energy absorbers. Study based upon literature
thermal technologies	and experiment exchanges
[DB81-025934] p0081 N82-15545	[SF-RAPP-1979/4] p0077 N82-13548
Solar energy training program for code enforcement	Low-cost mirror concentrator based on inflated,
personnel	double-walled, metallized, tubular films
[DE81-030053] p0081 N82-15563	[DB81-027813] p0081 N82-15551
Comparative thermal performance of direct gain,	Transwall: A modular visually transmitting
Trombe, and sunspáce walls	thermal storage wall
[DE81-030546] p0081 N82-15571	[DB81-029821] p0160 N82-15579
SERI Solar-Energy-Storage Frogram	SOLAR ENERGY CONVERSION
[DE81-029476] p0082 882-15576	Solar materials science Book
Development of a modular heat exchanger with	p0037 A82-10007
integrated latent heat energy store for	Introduction to solar materials science
solar heating applications	p0037 A82-10008
[BMPT-PB-T-81-050] p0160 H82-15584	Introduction to the role of crystal defects in
Assessment of the long-range transport of	solar materials
residential woodstove fine-particulate emissions	p0037 A82-10009
for two future United States energy scenarios	Surface and interface studies and the stability of
[DE81-030096] p0033 N82-15613	solid solar energy materials
SOLAR ENERGY ABSORBERS	p0037 A82-10010
Introduction to solar materials science	Materials science issues encountered during the
p0037 A82-10008	development of thermochemical concepts in
Introduction to the role of crystal defects in	screening of reactions for solar energy
solar materials	
p0037 A82-10009	applications
	p0038 A82-10021
The optical properties-microstructure relationship	The optimization of solar conversion devices
in particulate media - Optical tailoring of	p0039 A82-10025
solar absorbers	Photoacoustic figure of merit for photothermal
p0037 A82-10011	energy conversion efficiency
Fundamental limits to the spectral selectivity of	
	n0121 182-10192
composite materials for sheething color	p0121 182-10192
composite materials for absorbing solar	Prospects for the development of solar energy in
radiation	Prospects for the development of solar energy in the USSR Production of electric power by
radiation p0038 A82-10015	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods
radiation	Prospects for the development of solar energy in the USSR Production of electric power by
radiation p0038 A82-10015	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385
radiation p0038 182-10015 Composite film selective-absorbers for solar radiation collection	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 Some characteristics of silicon photocells
radiation p0038 A82-10015 Composite film selective-absorbers for solar radiation collection p0038 A82-10016	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 Some characteristics of silicon photocells fabricated by planar technology
radiation p0038 A82-10015 Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Corrosion science and its application to solar	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 Some characteristics of silicon photocells fabricated by planar technology p0039 A82-10386
radiation p0038 A82-10015 Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Corrosion science and its application to solar thermal energy material problems	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 Some characteristics of silicon photocells fabricated by planar technology p0039 A82-10386 Present state of research on selective coatings
radiation p0038 A82-10015 Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Corrosion science and its application to solar thermal energy material problems p0038 A82-10017	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 Some characteristics of silicon photocells fabricated by planar technology p0039 A82-10386 Present state of research on selective coatings for solar-energy converters
radiation p0038 A82-10015 Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Corrosion science and its application to solar thermal energy material problems p0038 A82-10017 Thermal storage in salt-hydrates	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 Some characteristics of silicon photocells fabricated by planar technology p0039 A82-10386 Present state of research on selective coatings for solar-energy converters p0039 A82-10387
radiation p0038 A82-10015 Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Corrosion science and its application to solar thermal energy material problems p0038 A82-10017	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 Some characteristics of silicon photocells fabricated by planar technology p0039 A82-10386 Present state of research on selective coatings for solar-energy converters
radiation p0038 A82-10015 Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Corrosion science and its application to solar thermal energy material problems p0038 A82-10017 Thermal storage in salt-hydrates p0153 A82-10018	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 Some characteristics of silicon photocells fabricated by planar technology p0039 A82-10386 Present state of research on selective coatings for solar-energy converters p0039 A82-10387 Regime characteristics of a solar thermoelectric
radiation p0038 A82-10015 Composite film selective-absorbers for solar radiation collection p0038 A82-10016 Corrosion science and its application to solar thermal energy material problems p0038 A82-10017 Thermal storage in salt-hydrates	Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 Some characteristics of silicon photocells fabricated by planar technology p0039 A82-10386 Present state of research on selective coatings for solar-energy converters p0039 A82-10387

p0153 A82-10019

p0040 A82-10390

Performance analysis of d.c.-motor-photovoltaic converter system. II - Series and shunt excited Solar-thermal experimental projects on the Spanish Plataforma Solar motors p0043 A82-11213 An experimental study of SC3 dissociation as a mechanism for converting and transporting solar p0043 A82-11214 Plutonium thermochemical sclar cell p0043 A82-11215 Analysis of power, mass, and size parameters of solar vapor-turbine two-circuit systems with organic working bodies p0044 A82-11421 Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 Efficiency of selective surfaces for solar thermal collectors p0044 A82-11425 Solar energy technology - A five-year update P0044 A82-11541 A solar simulator-pumped gas laser for the direct conversion of sclar energy p0044 A82-11710 High efficiency thin-film GaAs solar cells p0046 A82-11767 Small sodium sulfur battery for solar and wind energy systems D0047 A82-11778 A central tower solar test facility /EM/CTSTF/ p0048 A82-11797 Secondary concentrators for parabolic dish solar thermal power systems p0048 A82-11798 Development of a solar receiver for an organic Rankine cycle engine p0048 A82-11800 Thermionic application for future air force space power systems p0124 A82-11822 Utilization of wind/solar energy in generating electricity in Saudi Arabia p0049 A82-11830 Methods and problems of industrial-scale electric America power generation from sclar energy p0050 A82-12506 Photovoltaics, the solar electric solution p0050 182-12532 Photoelectrochemical behaviour of CdS/NaI.3.3NH3 /liquid sodium iodide agmoniate/ junctions -Utılization ın solar energy conversion gas lasers p0051 A82-12822 High-temperature sclar central receivers p0052 A82-12949 Investigation of the possibility of using inexpensive concentrating systems in the modules of a photoelectric station p0052 A82-13713 Analysis of the optical characteristics of solar collectors p0052 A82-13715 System of tolerances for a solar-tower power station p0053 A82-13717 Mathematical simulation model for the operation of SOLAR PLUX the optical system of a solar power station p0053 A82-13718 Data Network [DE82-000071] SOLAR PLUX DRNSITY Dish concentrators for sclar thermal energy -Status and technology development [AIAA PAPER 81-2530] p0053 A82-14001 OTEC ocean system development [AIAA PAPER 81-2590] p0130 A82-14038 [DE81-029483] SOLAR PURMACES Introduction of solar energy in Saudi Arabia - A case study p0056 A82-15660 Solar chemistry of metal complexes --- hydrogen SOLAR GENERATORS Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells p0058 A82-16133 Photoanode on the base of pheophytin-sensitized

p0059 A82-16742

D0059 A82-17099

The use of semiconducting oxide ceramics in solar

energy conversion

p0059 A82-17128 Hydrogen from solar energy p0085 A82-17129 Electric utility modeling extensions to evaluate solar plants p0061 A82-18025 Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82-10276 Thin-film polycrystalline cadmium telluride solar cells and large-area polycrystalline silicon solar cells p0062 N82-10490 Technical and economic assessment of solar thermophotovoltaic conversion [DE81-803762] p0064 N82-10515 Technological activities for high performance receivers --- for solar thermal power plants [BMFT-FB-T-80-133] p0066 N82-10571 User needs for solar decision-making tools: The homebuilding industry p0067 N82-11325 f DE81-0272931 DOR solar-assisted heat-pump program: Its evolution and its potential [DE81-026055] p0067 N82-11413 Carlisle house: An a [DOE/ET-20279/133] An all-solar electric residence p0071 N82-11622 Passive solar technical planning study
[EPRI-EM-1591] D0072 N82-12578 Intermediate photovoltaic system application experiment operational performance: Executive RI Faso, Texas
[DE91-031934]

p0072 N82-1 D0072 N82-12602 Basis for research proposals concerning (industrial) solar energy production processes derived from biological principles p0075 N82-12640 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] New and renewable energy in the United States of [DE81-030887] p0024 N82-13539 Market assessment of photovoltaic power systems for agricultural applications in Morocco [NASA-CR-165477] p0077 N82-14627 Advanced solar energy conversion --- solar pumped [NASA-UK-165060] p0079 N82-15526 Solar power systems smaller than 500 W for military nee military use [PML-1980-06] p0080 N82-15534 Organic fluids for the practical use in energy conversion systems of solar power plants [BMFT-FB-T-81-154] p0080 N82-15537 Annual DOE Active Solar Heating and Cooling Contractors Review meeting . p0081 N82-15572 F DE81-0280521 Overview of active solar absorption/Rankine cooling program [DE81-028041] Environmental data for sites in the National Solar p0075 N82-12707 Solar energy modulator [NASA-CASE-NPO-15388-1] p0063 N82-10496 Automated Fresnel lens tester system p0066 N82-10863 Design and test of two-step solar oil shale retort [DE82-000964] p0077 N82-13543 Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods Regime characteristics of a solar thermoelectric generator and comparison of experimental and calculated data p0040 A82-10390 Production of alloys of bismuth telluride for solar thermoelectric generators D0041 A82-10471

Molten salt thermal energy storage subsystem for . Solar Thermal Central Receiver plants	A solar beating system with annual storage p0056 A82-15666
p0047 A82-11780	Thermal performance of a solar still
A central tower solar test facility /RM/CTSTP/ p0048 A82-11797 Utilization of wind/sclar energy in generating	p0058 A82-16229 Solar project description for Colorado Sunworks: Single family
electricity in Saudi Arabia p0049 A82-11830	[DE81-028054] p0064 H82-10510 Solar project description for living systems
The effect of non-Markovian cloud patterns on the design of a regulator for a solar-powered boiler p0052 A82-13083	single family residence, Davis, California [DE01-029743] p0064 N82-10511 State of the art in passive solar heating
Material property data and their use in design and analysis for an elevated temperature solar code p0055 A82-14847	[LA-UR-81-2185] p0065 N82-10537 Los Alamos National Laboratory Passive Solar Program [DE81-028778] p0065 N82-10538
Method for calculating the unsteady temperature	Summary of passive-solar-retrofit workshops
conditions of the generator in a solar refrigeration system	[DE81-028146] p0065 M82-10547 Application of solar thermal energy to buildings
p0056 A82-15642 The design of a sodium-cocled 2.7 MW receiver for	and industry [SERI/TP-641-1222] p0066 N82-10563
a solar power plant p0059 A82-17126	The young solar collector: An evaluation of its multiple farm uses
Solar-thermal experimental projects on the Spanish Plataforma Solar	[PB81-214132] p0066 N82-10577
p0059 A82-17128	Solar energy system performance evaluation: Porest City Dillon, Washington, D.C., January
, Hydrogen from solar energy p0085 A82-17129	1980 - December 1980 [DE81-028174] p0068 N82-11560
Testing and evaluation of a solar photovoltaic flywheel energy storage system	Solar energy system performance evaluation: Bontecito Pines, Santa Rosa, California,
[DOE/ET-20279/130] p0065 N82-10558	November 1979 - April 1980
Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background	Study of photovoltaic cost elements. Volume 3:
[DE81-030982] p0069 N82-11566 Passive solar technical planning study	Sandıa National Laboratories photovoltaic systems design catalog
[EPRI-EM-1591] p0072 M82-12578 Comparative economics of sclar thermal central	[DE81-030986] p0069 M82-11567 Design, cost and performance comparisons of
receivers	several solar thermal systems for process heat.
[DE81-029623] p0072 M82-12601 Photovoltaic market analysis program: Background,	Volume 1: Executive summary [DE81-029881] p0069 N82-11576
model development, applications and extensions [DE81-029711] p0073 N82-12609	Solar heat pump simulator [DE81-024368] p0070 M82-11583
Economic assessment of advanced central-receiver solar-thermal power systems: Executive summary	Controls for solar heating and cooling [DE81-025209] p0070 N82-11593
[DOE/SF-10601/0] p0074 N82-12624	Long-term performance of the Hunn passive solar
Basis for research proposals concerning (industrial) sclar energy production processes	residence [DE81-028735] p0070 N82-11600
derived from biological principles p0075 N82-12640	Beat storage duration [DE81-026635] p0070 N82-11602
Solar project at Almeria nears completion p0075 x82-12647	SOL-CYCLE: A solar-assisted solvent-recycling process for asphalt-impregnation of fiber board
Systems analysis of thermal storage [DE81-030288] p0079 #82-14658	[DE81-903377] p0070 N82-11615 Carlisle house: An all-solar electric residence
<pre>Energy storage systems for terrestrial solar generators cadmium/mercury oxide cells</pre>	[DOE/ET-20279/133] p0071 N82-11622 The Rogers focusing heliostat experimental program
[BMFT-FB-T-81-082] p0080 N82-15529 Gas cooled solar power plant for generating	at Rensselaer Polytechnic Institute [PB81-226813] p0071 N82-11625
electrical energy in the 20MWe operating range	Solar Heating And Cooling Of Buildings (SHACOB):
(GAST): Preliminary design phase [BMFT-PB-T-81-097] p0080 N82-15530	Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for
Development of a prototype of a 10 kW small solar power plant technology for developing nations	residential structures [DE82-900206] p0017 N82-12278
[BMFT-FB-T-81-101] p0080 N82-15532 Annual DOE Active Solar Heating and Cooling	Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2.
Contractors Beview meeting	Volume 2: Domestic hot water systems
[DE81-028052] p0081 N82-15572 SOLAR HEATING	[DE82-900207] p0071 N82-12279 Solar Heating And Cooling Of Buildings (SHACOB):
Thermal storage in salt-hydrates p0153 182-10018	Requirements definition and impact analysis-2. Volume 3: Customer load management systems
The application of reversible chemical reactions to solar thermal energy systems	[DE82-900208] p0071 N82-12280 Guidebook for solar process-heat applications
p0038 A82-10020 Alternative power sources for residential	[DE81-027977] p0072 N82-12598
air-conditioning systems	Optimization of solar heating and cooling systems [NP-1903997] p0072 N82-12599
p0039 A82-10331 Development of a solar thermal central heat	Summertime results from the class B passive-solar performance-monitoring program
receiver using molten salt [ASME PAPER 81-SOL-2] p0041 A82-10970	[DE81-025471] p0074 N82-12627 Economic implications of passive-solar retrofit
Conceptual design of an advanced water/steam receiver for a solar thermal central power system	for single-family residences in Albuquerque, New Mexico: A case study
[ASHE PAPER 81-SOL-5] p0042 A82-10973	[DE81-028402] p0074 B82-12630
A novel latent heat storage for sclar space heating systems - Refrigerant storage	The properties of solar and heat pump heating systems of small houses and additional heat
p0043 A82-11386 A simplified method for direct calculation of the	sources [VTT-56] p0075 B82-12644
annual load fraction of solar systems for space heating	Ultimate in building energy analysis: DOB-2 and BLAST
p0054 A82-14405 Optimization of flow passage geometry for	[DE81-028703] p0023 N82-13263 Fuels and chemicals made from solar energy
air-heating, plate-type sclar collectors p0055 A82-14846	[DE81-025018] p0077 882-14384
F-1-22 202 14040	

SUBJECT INDEX SOLAR REFLECTORS

REPEAT facility. Report for May, June, July [DE81-028156] p0079 F82-14665 Solar-supplemented, natural air drying of shelled	SOLAR POWER SATELLITES Direct conversion of light to radio frequency energy using photoklystrons for solar power
corn: The economic limitations	satellites
[PB81-235681] p0079 B82-14668 Performance predictions of passive solar commercial buildings	p0045 A82-11712 Series vs. shunt regulators for power control in satellite power systems
[DE81-027979] p0079 M82-15247 Low-cost passive-solar retrofits for new and existing mobile boxes	p0045 A82-11738 Cost and performance projections for SPS photovoltaic blankets
[DE81-028356] p0081 M82-15544 Annual DOE Active Solar Heating and Cooling	p0045 A82-11741 Solar power satellite microwave power transmission
Contractors Review meeting [DE81-028052] p0081 N82-15572	and reception system p0145 A82-11743
Incremental cooling load determination for passive direct gain heating systems	Antenna optimization and cost consideration for the Solar Power Satellite microwave system p0145 A82-11744
[DE81-029882] p0081 M82-15575 Verification of BLAST by comparison with	Advanced Satellite Power System /SPS/ concept
measurements of a solar-dominated test cell and a thermally massive building	p0049 A82-11835 International Scientific Conference on Space,
[DE81-029883] p0082 M82-15578 Development of a modular heat exchanger with	21st, Rome, Italy, March 25, 26, 1981, Proceedings p0050 182-12501
<pre>integrated latent heat energy store for solar heating applications</pre>	Mechanical and nonlinear effects in microwave power transmission
[BMFT-FB-T-61-050] p0160 N82-15584 Supplement to energy for rural development:	p0145 A82-12504 Environmental factors of power satellites
Renewable resources and alternative technologies for developing countries	p0002 A82-12505 Transportation systems and cost comparison for
[PB61-231011] p0032 N82-15592 SOLAR HOUSES	launching an SPS into geosynch. orbit
Solar project description for Colorado Sunworks: Single family	p0050 A82-12507 Solar power satellite system energy balance p0050 A82-12509
[DB81-028054] p0064 N82-10510 Testing and evaluation of a solar photovoltaic flywheel energy storage system	Chronic exposure of a honey bee colony to 2.45 GHz continuous wave microwaves p0003 A82-14347
[DOE/ET-20279/130] p0065 N82-10558 MASEC SOLAR 80 home designs	Space chamber experiments of ohmic heating by high power microwave from the Solar Power Satellite
[DE81-028344] p0067 N82-11316 Long-term performance of the Hunn passive solar	p0145 A82-16991 Application of solar power satellites to India's
residence [DE81-028735] p0070 N82-11600	energy needs - A macroengineering solution to a macroproblem
Heat storage duration [DE81-026635] . p0070 N82-11602	p0062 A82-18645 Satellite power system: Concept development and
Carlisle house: An all-sclar electric residence	evaluation program. Volume 4: Energy
[DOE/ET-20279/133] p0071 N82-11622 Plexibilities in passive design: Examining some limiting solar myths	conversion and power management [NASA-TM-58237-VOL-4] p0078 N82-14634 Satellite power system: Concept development and
[DE81-028401] p0073 N82-12623 Performance analysis of 11 Denver Metro passive	evaluation program. Volume 7: Space transportation
homes [DE81-025473] p0074 N82-12626	[NASA-TH-58238-VOL-7] p0078 N82-14635 Study of multi-megawatt technology needs for
Summertime results from the class B passive-solar performance-monitoring program	photovoltaic space power systems. Volume 1: Executive summary
[DE81-025471] p0074 N82-12627	[NASA-CR-165323-VOL-1] p0078 N82-14636
The properties of solar and heat pump heating systems of small houses and additional heat	Study of multi-megawatt technology needs for photowoltaic space power systems, volume 2
sources [VTT-56] p0075 N82-12644	[NASA-CR-165323-VOL-2] p0078 R82-14637 SOLAR RADIATION
Appliance efficiency and the solar building [DE81-029073] p0075 N82-13265	Performance evaluation of the solar kinetics T-700 line concentrating solar collector
Low-cost passive-solar retrofits for new and existing mobile homes	[NASA-CR-161856] p0063 N82-10502 Mississippi County Community College solar
[DE81-028356] p0081 N82-15544	photovoltaic project
Summary of passive solar multi-family design workshops	[DE81-030669] p0068 N82-11554 SOLTECH 80
[DE81-030353] p0081 N82-15564 SOLAR PONDS (HEAT STORAGE)	[DB81-901931] p0079 N82-14643 Use of oxide decompositions in advanced
Modeling and testing a salt gradient solar pond in northeast Ohio p0043 A82-11210	thermochemical hydrogen cycles for solar heat sources. Application of the tricobalt tetraoxide-cobalt monoxide pair
Solar perspectives - Israel, solar pond innovator p0052 A82-12950	(DE81-030235) p0082 N82-15581
Thermal analysis of three zone solar pond p0054 A82-14406	Dish concentrators for solar thermal energy - Status and technology development
Material property data and their use in design and analysis for an elevated temperature solar code	[AIAA PAPER 81-2530] p0053 A82-14001 Aplanatic double reflection system for
p0055 A82-14847 Comparative economic performance of selected	thermophotovoltaic applications - Design p0060 A82-17293
passive solar heating and cooling technologies [DE81-030220] p0072 M82-12600	<pre>Pinite Lambertian source analysis of concentrators - Application to solar reflectors</pre>
SOLTECH 80 [DE81-901931] P0079 N82-14643	p0060 A82-17294 User's guide to HELIOS: A computer program for
SOLAR POSITION Simple tracking strategies for solar concentrations	<pre>modeling the optical behavior of reflecting solar concentrators. Part 1: Introduction and</pre>
p0042 A62-11207	code input [DE81-031920] p0073 882-12616

SOLAR SIMULATORS SUBJECT INDEX

SOLAR SIMULATORS	SOLID SURPACES
A solar simulator-pumped gas laser for the direct	Surface and interface studies and the stability of
conversion of sclar energy	solid solar energy materials
p0044 A82-11710 SOLAR THERMAL PROPULSION	p0037 A82-10010 Colloidally deposited high-temperature solar
Use of solar thermal energy to generate electricity	selective surfaces
[DE81-028797] p0070 N82-11606	P0055 A82-15439
Economic assessment of advanced central-receiver	SOLID WASTES
solar-thermal power systems: Executive summary	Advanced system experimental facility: Solid
[DOE/SF-10601/0] p0074 N82-12624 Solar thermal energy systems	waste to methane gas. Background and process description
[DE81-029295] pc077 N82-13531	[DE81-030198] p0101 N82-11244
Industrial process heat applications for solar	Energy recovery from municipal solid waste and
thermal technologies	sewage sludge using multi-solid fluidized bed
[DE81-025934] p0081 N82-15545	combustion technology
SOLAR TOTAL ENERGY SYSTEMS	[DE82-001142] p0110 N82-12596
Testing of the U.S. Solar Pilot Plant receiver [ASME PAPER 81-SCL-3] p0041 A82-10971	Conversion of municipal solid waste to energy, Jacksonville, Florida, phase 1
The Texas Instruments Solar Energy System	[DE82-000808] p0019 N82-12613
develorment	Development of testing procedures and
p0047 A82-11773	bibliographic information relevant to the
An evaluation of alternate system configurations	testing of solid wastes resulting from
for solar repowering electric power plants	synthetic-fuels production [DB81-030671] p0021 M82-12673
p0048 A82-11803 Mathematical simulation model for the operation of	[DE81-030671] p0021 N82-12673 Power-plant fly-ash utilization: A
the optical system of a sclar power station	chemical-processing perspective
p0053 A82-13718	[DE81-025452] p0022 N82-13191
Electric utility modeling extensions to evaluate	Chemical element concentrations in liquids and
solar plants	solids associated with power plants using FGD
p0061 A82-18025	Systems
An analytical comparison of the efficiency of solar thermal collector arrays with and without	[DE61-030422] p0027 M82-14322 Energy recovery from municipal waste development
external manifolds	program for Idaho Falls, Idaho
[NASA-CR-161852] p0063 N82-10501	[DE81-029999] p0028 N82-14659
Solar thermal energy systems	Coal conversion solid waste disposal
[DE81-029295] p0077 N82-13531	[DE81-028567] p0116 882-14680
SOLETIAS Contributions of space reflector technology to	SOLUBILITY Top overlange characteristics of onhanced call
food production, local weather manipulation and	<pre>Ion exchange characteristics of enhanced oil recovery systems (miscibility studies)</pre>
energy supply, 1985-2020	[DE81-769734] p0096 N82-10478
P0054 A82-14445	Coal hydrogenation via bonding of metallic
SOLID ELECTRODES	compounds to coal, part 1. Solubilization of
Advances in coal fired MHD generator research p0126 A82-11853	Illinois bituminous coal - the critical
Status report on MED generator materials	<pre>importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236</pre>
p0126 A82-11854	SOLVENT EXTRACTION
Sputtered thin film electrodes for	Solvent-Refined Coal (SRC) process
photoelectrochemical cells	[DE81-031937] p0106 N82-12197
p0055 A82-15111	Supercritical multicomponent solvent coal extraction
Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries	[NASA-CASE-NPO-15767-1] p0107 N82-12241 High-pressure solvent extraction of methane from
p0155 A82-15727	geopressured fluids
Photoanode on the base of pheophytin-sensitized	[DE81-027713] p0117 N82-15227
reactions	SOLVERT REFINED COAL
p0059 A82-16742	Soot formation in synthetic fuel droplets
The use of semiconducting oxide ceramics in solar energy conversion	[DE81-028391] p0092 N82-10150 Cryogenic methane separation/catalytic
p0059 182-17099	hydrogasification process analysis
Design of a cell for electrode kinetic	[DE81-029123] p0093 N82-10152
investigations of fuel cell reactions	Development and application of analytical
p0136 A82-18394	techniques to chemistry of donor solvent
Life-testing of 1.7 kW h zinc-chloride battery system - Cycles 1 - 1000	liquefaction [DE81-029125] p0099 N82-11166
p0155 A82-18498	Solvent-Refined Coal-1 Demonstration Project.
SOLID PHASES	Final environmental impact statement, Volume 1
Efficient S1 solar cells by low-temperature	of 2 coal liquefaction plant at Nevman,
solid-phase epitaxy	Kentucky
p0043 A82-11344	[DE81-025983] p0010 N82-11252
Solid-solid reactions in coal conversion processes p0107 N82-12238	Process development for improved SRC options. Kerr-McGee critical solvent deashing and
SOLID STATE DEVICES	fractionation studies
Session on solid state: Introduction	[DE81-903785] p0114 N82-14380
p0149 N82-12565	SOLVENTS
Modified reference SPS with solid state	Investigation of mechanisms of hydrogen transfer
transmitting antenna p0149 N82-12566	in coal hydrogenation [DE81-030492] p0099 N82-11165
SPS solid state antenna power combiner	SOL-CYCLE: A solar-assisted solvent-recycling
p0149 N82-12567	process for asphalt-impregnation of fiber board
Solid-state retrodirective phased array concepts	[DE81-903377] p0070 N82-11615
for microwave power transmission from Solar	SURT SURTHER S
Power Satellite p0149 N82-12568	Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics
SOLID STATE PHYSICS	[DE81-029480] p0093 N82-10155
Introduction to photovoltaics - Physics, materials	Soot formation in synfuels
and technology	[DE81-030273] p0099 N82-11164
p0038 A82-10022	Effects of components of synfuels on soot formation
	[DE81-027961] p0101 N82-11242

SORPTION	
Studies of the regeneration of activated bauxit	e
used as granular sorbent for the control of	
alkalı vapors from hot flue gas of coal combu	stion
[DE81-030192] p0008 N82-	
SOUNDING POOCO #82-	10330
Geomagnetic and magnetotelluric soundings in the	e
area of the Central European rift system	
[BMFT-FB-T-81-111] p0119 N82-	15656
SOUTH DAKOTA	
Wood resources and utilization patterns in the	
North Central Region and energy needs for the	
manufacture of wood products	
	40.00
[DB81-030356] p0019 N82-	12604
SPACE CHARGE	
Field nonuniformity due to photogenerated carri	ers
in a p-i-n solar cell	
p0060 A82-	17650
SPACE COOLING (BUILDINGS)	.,050
Quarterly report of solar federal buildings	
program in the MASEC region	
[DB81-027968] p0062 N82-	10276
Application of solar thermal energy to building	s
and industry	
[SERI/TP-641-1222] p0066 N82-	10563
	10262
Assessment of building diagnostics	
[DE81-027078] p0012 N82-	11321
Brayton/Rankine 10-ton gas-fired space	
conditioning system, phase 2	
[PB81-223372] p0139 N82-	11478
Passive solar technical planning study	
	12570
[EPRI-EM-1591] p0072 N82-	
Optimization of solar heating and cooling syste	
[NP-1903997] p0072 N82-	12599
Comparative economic performance of selected	
passive solar heating and cooling technologie	s
[DE81-030220] p0072 N82-	
	12000
Annual cycle energy system experimental	
performance and national applicability	
[DE81-028570] p0024 N82-	13523
SPACE EXPLORATION	
Highlights of 1981 activities	
[NASA-NEWS-RELEASE-81-199] p0161 N82-	15000
	13000
SPACE HEATING (BUILDINGS)	
The application of reversible chemical reaction	•
	⊷
to solar thermal energy systems	~
to solar thermal energy systems	
to solar thermal energy systems p0038 A82-	
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space	
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage	10020
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82-	10020 11386
to solar thermal energy systems p0038 A82- A novel latent heat storage for solar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t	10020 11386 he
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82-	10020 11386 he
to solar thermal energy systems p0038 A82- A novel latent heat storage for solar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t	10020 11386 he
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating	10020 11386 he ce
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82-	10020 11386 he ce
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test	10020 11386 he ce 14405
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen	10020 11386 he ce 14405
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program	10020 11386 be ce 14405
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82-	10020 11386 be ce 14405
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings	10020 11386 be ce 14405
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings	10020 11386 be ce 14405
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region	10020 11386 he ce 14405 t 10153
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82-	10020 11386 he ce 14405 t 10153
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmentest program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82- Solar project description for Public Service	10020 11386 he ce 14405 t 10153
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family	10020 11386 he ce 14405 t 10153
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico	10020 11386 he ce 14405 t 10153
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82-	10020 11386 he ce 14405 t 10153
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico	10020 11386 he ce 14405 t 10153
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmentest program [DE81-030219] p0093 N82- Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82- Solar project description for living systems	10020 11386 he ce 14405 t 10153
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California	10020 11386 he ce 14405 t 10153 10276
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-02743] D064 N82-	10020 11386 be ce 14405 t 10153 10276 10509 10511
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-029743] p0064 N82- Application of solar thermal energy to building	10020 11386 be ce 14405 t 10153 10276 10509 10511
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-029743] Application of solar thermal energy to building and industry	10020 11386 he ce 14405 t 10153 10276 10509 10511 s
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-029743] p0064 N82- Application of solar thermal energy to building	10020 11386 he ce 14405 t 10153 10276 10509 10511 s
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-029743] Application of solar thermal energy to building and industry	10020 11386 he ce 14405 t 10153 10276 10509 10511 s
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82- Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82- Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82- Solar project description for living systems single family residence, Davis, California [DE81-02743] p0064 N82- Application of solar thermal energy to building and industry [SERI/TP-641-1222] p0066 N82- Energy analysis sample building data	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-029743] Application of solar thermal energy to building and industry [SERI/TP-641-1222] Energy analysis sample building data [DE81-027188]	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-02743] Application of solar thermal energy to building and industry [SERI/TP-641-1222] Energy analysis sample building data [DE81-027188] Assessment of building diagnostics	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-027853] Application of solar thermal energy to building and industry [SERI/TP-641-1222] Energy analysis sample building data [DE81-027188] Assessment of building diagnostics [DE81-027078] P0012 N82-	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82- Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82- Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Kio Rancho, New Mexico [DE81-027853] p0063 N82- Solar project description for living systems single family residence, Davis, California [DE81-027853] p0064 N82- Application of solar thermal energy to building and industry [SERI/TP-641-1222] p0066 N82- Energy analysis sample building data [DE81-027188] p0011 N82- Assessment of building diagnostics [DE81-027078] Investigation of direct expansion in ground sou	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-027943] Application of solar thermal energy to building and industry [SERI/MP-641-1222] Energy analysis sample building data [DE81-027188] Assessment of building diagnostics [DE81-027078] Investigation of direct expansion in ground sou heat pumps	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82- Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82- Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Kio Rancho, New Mexico [DE81-027853] p0063 N82- Solar project description for living systems single family residence, Davis, California [DE81-027853] p0064 N82- Application of solar thermal energy to building and industry [SERI/TP-641-1222] p0066 N82- Energy analysis sample building data [DE81-027188] p0011 N82- Assessment of building diagnostics [DE81-027078] Investigation of direct expansion in ground sou	10020 11386 be ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-027853] Application of solar thermal energy to building and industry [SERI/TP-641-1222] Energy analysis sample building data [DE81-027188] Assessment of building diagnostics [DE81-027078] Investigation of direct expansion in ground sou heat pumps [DE81-024139] p0012 N82-	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418
p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82- Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82- Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82- Solar project description for living systems single family residence, Davis, California [DE81-02783] p0064 N82- Solar project description for living systems single family residence, Davis, California [DE81-02783] p0064 N82- Energy analysis sample building data [DE81-027188] p0011 N82- Energy analysis sample building data [DE81-027078] p0012 N82- Investigation of direct expansion in ground sou heat pumps [DE81-024139] p0012 N82- Well-water-source heat pump field performance s	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy
p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82- Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82- Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82- Solar project description for living systems single family residence, Davis, California [DE81-027853] p0064 N82- Solar project description for living systems single family residence, Davis, California [DE81-027183] p0064 N82- Energy analysis sample building data [DE81-027188] p0011 N82- Assessment of building diagnostics [DE81-027078] p0012 N82- Investigation of direct expansion in ground sou heat pumps [DE81-024139] p0012 N82- [DE81-024139] p0012 N82- [DE81-024136] p0012 N82- [DE81-024136]	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-02783] Application of solar thermal energy to building and industry [SERI/TP-641-1222] Energy analysis sample building data [DE81-027188] Assessment of building diagnostics [DE81-027078] Investigation of direct expansion in ground sou heat pumps [DE81-024139] Well-water-source heat pump field performance s [DE81-024136] Brayton/Rankine 10-ton gas-fired space	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy
novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82-A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82-Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82-Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82-Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82-Solar project description for living systems single family residence, Davis, California [DE81-027853] p0064 N82-Solar project description for living systems single family residence, Davis, California [DE81-027183] p0064 N82-Application of solar thermal energy to building and industry [SERI/TP-641-1222] p0066 N82-Energy analysis sample building data [DE81-027188] p0011 N82-Assessment of building diagnostics [DE81-027078] Investigation of direct expansion in ground sou heat pumps [DE81-024136] p0012 N82-Brayton/Rankine 10-ton gas-fired space conditioning system, phase 2	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy 11419
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-02785] Application of solar thermal energy to building and industry [SERI/TP-641-1222] Energy analysis sample building data [DE81-027188] Assessment of building diagnostics [DE81-027078] Investigation of direct expansion in ground sou heat pumps [DE81-024139] Well-water-source heat pump field performance s [DE81-024136] Brayton/Rankine 10-ton gas-fired space conditioning system, phase 2 [PB81-223372] D0139 N82-	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy 11419
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-027853] Solar project description for living systems single family residence, Davis, California [DE81-02785] Application of solar thermal energy to building and industry [SERI/TP-641-1222] Energy analysis sample building data [DE81-027188] Assessment of building diagnostics [DE81-027078] Investigation of direct expansion in ground sou heat pumps [DE81-024139] Well-water-source heat pump field performance s [DE81-024136] Brayton/Rankine 10-ton gas-fired space conditioning system, phase 2 [PB81-223372] D0139 N82-	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy 11419
to solar thermal energy systems p0038 A82- A novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82-Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82-Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82-Solar project description for living systems single family residence, Davis, California [DE81-02743] p0064 N82-Application of solar thermal energy to building and industry [SERI/MP-641-1222] p0066 N82-Energy analysis sample building data [DE81-027188] p0011 N82-Assessment of building diagnostics [DE81-027078] p0012 N82-Usestigation of direct expansion in ground sou heat pumps [DE81-024136] p0012 N82-Well-water-source heat pump field performance s [DE81-024136] p0012 N82-Grayton/Rankine 10-ton gas-fired space conditioning system, phase 2 [PB81-223372] p0139 N82-Practical demonstration of heat pumps for	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy 11419
novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 882- A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 882- Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 882- Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 882- Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 882- Solar project description for living systems single family residence, Davis, California [DE81-02785] p0064 882- Application of solar thermal energy to building and industry [SERI/TP-641-1222] p0066 882- Energy analysis sample building data [DE81-027188] p0012 882- Energy analysis sample building data [DE81-027078] p0012 882- Investigation of direct expansion in ground sou heat pumps [DE81-024136] p0012 882- Investigation of direct expansion in ground sou heat pumps [DE81-024136] p0012 882- Energy analysis sample bump field performance s [DE81-024136] p0012 882- Energy analysis sample pump field performance s [DE81-024136] p0012 882- Energy analysis sample field performance s [DE81-024136] p0012 882- Energy analysis sample pump field performance s [DE81-024136] p0012 882- Energy analysis sample field performance s [DE81-024136] p0012 882- Energy analysis sample field performance s [DE81-024136] p0012 882- Energy analysis sample field performance s [DE81-024136] p0012 882- Energy analysis sample field performance s [DE81-024136] p0012 882- Energy analysis sample field performance s [DE81-024136] p0012 882- Energy analysis sample field performance s [DE81-024136] p0012 882- Energy analysis sample field performance s [DE81-024136] p0012 882- Energy analysis sample field performance s [DE81-024136] p0012 882-	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy 11419
novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82-A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82-Plame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82-Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82-Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82-Solar project description for living systems single family residence, Davis, California [DE81-027853] p0064 N82-Solar project description for living systems single family residence, Davis, California [DE81-027183] p0064 N82-Bnergy analysis sample building data [DE81-027188] p0011 N82-Bnergy analysis sample building data [DE81-027078] p0012 N82-Bnergy analysis sample building data [DE81-027183] p0012 N82-Bnergy analysis sample full preformance s [DE81-024136] p0012 N82-Bnergy analysis sample field performance s [DE81-024136] p0012 N82-Brayton/Rankine 10-ton gas-fired space conditioning system, phase 2 [PB81-223372] p0139 N82-Practical demonstration of heat pumps for utilization of animal-generated heat [BMFT-FB-T-80-100] p0017 N82-	10020 11386 he ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy 11419
novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82-A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82-Flame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82-Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82-Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82-Solar project description for living systems single family residence, Davis, California [DE81-027853] p0064 N82-Application of solar thermal energy to building and industry [SERI/TP-641-1222] p0066 N82-Energy analysis sample building data [DE81-027188] p0011 N82-Energy analysis sample building data [DE81-027078] p0012 N82-Energy analysis sample field performance s [DE81-024136] p0012 N82-Energy analy	10020 11386 be ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy 11479 11478
novel latent heat storage for sclar space heating systems - Refrigerant storage p0043 A82-A simplified method for direct calculation of t annual load fraction of solar systems for spa heating p0054 A82-Plame-retention head burner efficiency test results and analysis: Space-heating-equipmen test program [DE81-030219] p0093 N82-Quarterly report of solar federal buildings program in the MASEC region [DE81-027968] p0062 N82-Solar project description for Public Service Company of New Mexico (lot 7) single family residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82-Solar project description for living systems single family residence, Davis, California [DE81-027853] p0064 N82-Solar project description for living systems single family residence, Davis, California [DE81-027183] p0064 N82-Bnergy analysis sample building data [DE81-027188] p0011 N82-Bnergy analysis sample building data [DE81-027078] p0012 N82-Bnergy analysis sample building data [DE81-027183] p0012 N82-Bnergy analysis sample full preformance s [DE81-024136] p0012 N82-Bnergy analysis sample field performance s [DE81-024136] p0012 N82-Brayton/Rankine 10-ton gas-fired space conditioning system, phase 2 [PB81-223372] p0139 N82-Practical demonstration of heat pumps for utilization of animal-generated heat [BMFT-FB-T-80-100] p0017 N82-	10020 11386 be ce 14405 t 10153 10276 10509 10511 s 10563 11318 11321 rce 11418 tudy 11479 11478

```
Optimization of solar heating and cooling systems
     [NP-1903997]
                                               p0072 N82-12599
   Comparative economic performance of selected
      passive solar heating and cooling technologies
      [DE81-030220]
                                               p0072 N82-12600
   Summertime results from the class B passive-solar
      performance-monitoring program
      [DE81-025471]
                                               p0074 N82-12627
   Passive-solar-retrofit study for the United States
      Navy
      [DE81-028921]
                                                p0074 N82-12629
   Annual cycle energy system experimental performance and national applicability
      [DE81-028570]
                                               p0024 N82-13523
   Intermediate photovoltaic system application experiment operational performance report.
     volume 2 for Beverly High School, Beverly, Mass. [DE62-000811] p0077 N82-135
                                               p0077 N82-13532
   Residential site design and energy conservation.
                General report
      Part 1:
      [DE81-904010]
                                               p0027 N82-14398
   REPEAT facility.
                       Report for May, June, July
     [DE81-028156]
                                                p0079 N82-14665
   Moorhead district heating, phase 2
                                                p0031 N82-15556
     [DE81-029689]
   Summary of passive solar multi-family design
      workshops
      [DE81-030353]
                                                p0081 N82-15564
   Incremental cooling load determination for passive
     direct gain heating systems [DE81-029882]
                                                p0081 N82-15575
   Verification of BLAST by comparison with measurements of a solar-dominated test cell and
      a thermally massive building
      [DE81-029883]
                                                p0082 N82-15578
   Development of a modular heat exchanger with integrated latent heat energy store --- for solar heating applications
[BMFT-FB-T-81-050] p0160 N8:
SPACE MANUFACTURING
   Study of multi-megawatt technology needs for
     photovoltaic space power systems, volume 2 [NASA-CR-165323-VOL-2] p0078 N
                                               p0078 N82-14637
SPACE MISSIONS
   Aeronautics and space report of the President,
      1980 activities
     [NASA-TM-84079]
                                                p0035 N82-16022
SPACE PLASMAS
   Space chamber experiments of ohmic heating by high
      power microwave from the Solar Power Satellite
SPACE POWER REACTORS
   Applications of power beaming from space-based nuclear power stations
                                                p0145 A82-11746
   Development of space reactor core heat pipes
                                                p0122 A82-11747
   A compact, efficient thermoelectric module for a
      space reactor
                                                p0122 A82-11749
   Nuclear electric power for space systems -
Technology background and flight systems program
p0123 A82-11756
Thermionic application for future air force space
      power systems
                                                p0124 A82-11822
   Nuclear reactor closed Brayton cycle space power
      conversion systems
                                                D0126 A82-11840
SPACE POWER UNIT REACTORS
   Comparative analyses of space-to-space central
      power stations
      [NASA-TP-1955]
                                                D0150 N82-14202
SPACE PROCESSING
   International Scientific Conference on Space,
      21st, Rome, Italy, March 25, 26, 1981, Proceedings
                                               p0050 A82-12501
SPACE SHUTTLE ORBITERS
   Solar cell development for the Power Extension
      Package
                                               p0046 A82-11763
   The evaluation of four solar-array-powered
      multi-kW power conditioners for Space Shuttle
      Orbiter application
                                                p0046 A82-11772
   Satellite power system: Concept development and evaluation program. Volume 7: Space
      transportation
```

[NASA-TM-58238-VOL-7]

p0078 N82-14635

SPACE SHUTTLE PAYLOADS SUBJECT INDEX

SPACE SHUTTLE PAYLOADS	Thermionic application for future air force space
Solar power satellite system energy talance p0050 A82-12509	power systems p0124 A82-11822
Highlights of 1981 activities [NASA-NEWS-RELEASE-81-199] p0161 N82-15008	Advanced high temperature thermoelectrics for space power
SPACE SHUTTLES	p0125 A82-11823
Power management of multi-hundred kilowatt spacecraft power systems	'Thin foil cells - A challenge for space array designers'
p0046 A82-11769	p0049 A82-11842
Highlights of 1981 activities [NASA-NEWS-RELEASE-81-155] p0161 N82-15008	A technological approach towards future large solar arrays
SPACE SIMULATORS Solar concentrator panel and gore testing in the	p0055 A82-14446 Space nuclear safety and fuels program
JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005	p0111 N82-12921 Space applicable DOE photovoltaic technology: An
SPACE TRANSPORTATION Satellite power system: Concept development and	update [NASA-CR-165021] p0076 N82-13491
evaluation program. Volume 7: Space transportation	SPACECRAFT PROPULSION Heat pipes for NEP spacecraft radiators
[NASA-TM-58238-VCL-7] p0078 N82-14635	p0122 A82-11748
SPACE TRANSPORTATION SYSTEM	Honimaging concentrators for photovoltaic arrays
Transportation systems and cost comparison for	in space
launching an SPS into geosynch. orlit p0050 A82-12507 SPACECRAFT	p0046 A82-11761 Space applicable DOE photovoltaic technology: An nodate
SPACECRAFT Satellite power system: Concept development and evaluation program. Volume 7: Space	update [NASA-CR-165021] p0076 N82-13491 SPACECRAFT RADIATORS
transportation [NASA-TM-58238-VCL-7] p0078 N82-14635	Heat pipes for NEP spacecraft radiators p0122 A82-11748
SPACECRAPT DESIGN	SPACBLAB
High performance silicon solar arrays employing	International Scientific Conference on Space,
advanced structures p0045 A82-11758	21st, Rome, Italy, March 25, 26, 1981, Proceedings p0050 A82-12501
SPACECRAFT LAUNCHING	SPACETERNAS
Transportation systems and cost comparison for	SPS large array simulation
launching an SPS into geosynch. orbit	p0071 N82-12540
Highlights of 1981 activities [NASA-NEWS-RELEASE-81-199] p0161 N82-15008	Solar project at Almeria nears completion p0075 N82-12647
SPACECRAFT POWER SUPPLIES	SPECTRAL BHISSION
Development status of a regenerative fuel cell system for orbital operation	The emissivity of metals frequency and temperature dependence calculations for solar
p0153 A02-11707 A spacecraft thermophotovoltaic power source with	collector design p0038 A82-10014
thermal storage p0044 A82-11711	SPECTRAL REPLECTANCE Solar mirror materials - Their properties and uses
The nickel-hydrogen battery system - An historical overview	in solar concentrating collectors p0037 A82-10012
p0153 A82-11735 High power sclar array switching regulation p0045 A82-11736	The effect of soiling on solar mirrors and techniques used to maintain high reflectivity p0037 A82-10013
Ampere-hour integrator battery charge controller p0153 A82-11737	Optical degradation of antireflective silica film on solar collector windows
Series vs. shunt regulators for power control in satellite power systems	p0041 A82-10836 An integrating sphere based on absolute method for
p0045 A82-11738 Satellite power systems /SFS/ energy conversion	measuring solar absorptance p0058 A82-16247
and power management p0045 A82-11742 Projecting development testing of the GPHS-RTG	Metallurgical analysis and high temperature degradation of the black chrome solar selective
Engineering development testing of the GPHS-RTG converter General Purpose Heat	absorber p0060 A82-17252
Source-Radioisotope Thermoelectric Generator for	SPECTRAL SENSITIVITY Rundamental limits to the spectral selectivity of
Galileo orbiter power supply p0122 A82-11752	Fundamental limits to the spectral selectivity of composite materials for absorbing solar
Modular isotopic thermcelectric generator p0122 A82-11753	radiation p0038 A82-10015
Advances in space rower research and technology at the National Aeronautics and Space Administration	Composite film selective-absorbers for solar radiation collection
p0122 A82-11755 High- and low-resistivity silicon solar cells	p0038 A82-10016 Present state of research on selective coatings
p0046 A82-11762 Solar cell development for the Power Extension	for solar-energy converters p0039 A82-10387
Package p0046 182-11763	Spectrally selective copper sulphide coatings p0040 A82-10468
Gallium arsenide sclar cells-status and prospects for use in space	Solution grown PbS/CdS multilayer stacks as selective absorbers
p0046 A82-11765 Gals solar cells for space application	p0041 A82-10472 Combined solar-energy converters with selective
p0046 A82-11766 Power management of multi-hundred kilowatt	coatings p0044 A82-11424
spacecraft power systems p0046 A82-11769	Efficiency of selective surfaces for solar thermal collectors
The evaluation of four solar-array-powered multi-kW power conditioners for Space Shuttle	p0044 A82-11425 SPECTROSCOPIC AFALYSIS
Orbiter application	Development and application of analytical
p0046 A82-11772	techniques to chemistry of donor solvent
Multijunction high voltage concentrator solar cells p0047 A82-11796	liquefaction [DE81-025961] p0099 #82-11167

SUBJECT IEDEX STIRLIEG CICLE

SPECTRUM AMALISIS		Intergrated assessment for energy-rel	
Spectra over complex terrain [DE81-028734] p	0112 882-13473	<pre>environmental standards: A summary and findings</pre>	of issues
SPECULAR REPLECTION	***************************************	[DB81-028552]	p0014 N82-11646
Solar mirror materials - Their propert	ies and uses	Solar energy training program for cod	le enforcement
in solar concentrating collectors	0037 A82-10012	personnel [DE81-030053]	p0081 N82-15563
The effect of soiling on sclar mirrors	and	Heavy-duty engine baseline program as	
techniques used to maintain high ref	lectivity 0037 A82-10013	emission standard development (197) [PB81-244030]	2-73) p0034
SPEED CONTROL	0037 802-10013	STATIC INVERTERS	P0034 H02-13021
Variable speed wind turbine control sy		Semiconductor converters/inverters for	or
P Rotor speed control by automatic yawin	0127 A82-11859	photowoltaic power supply	p0126 A82-11857
two-bladed wind turbines with passiv		STATIC STABILITY	po
pitch variation	0400 100 11007	The stability of a tethered gyromill	
[AIAA PAPER 81-2570] p Wind-energy recovery by a static Scher	0129 A82-14027	[AIAA PAPER 81-2569] STATISTICAL AWALYSIS	p0129 A82-14026
induction generator		Sampling design for the 1980 commerc:	
	0131 A82-15650	multifamily residential building se	urvey p0011 #82-11320
Controlled Speed Accessory Drive demon	Stidtion	National interim energy-consumption	
[NASA-CR-165010] p	0026 N82-13981	Exploring the variability in energy	y consumption
SPENT FUELS Comparison of potential radiological c	ODSOURONCOS	[DE81-029910] STRADY STATE	p0018 N82-12589
from a spent-fuel repository versus	onbequences	Experimental evaluation of the stead	y-state and
natural-uranium deposits	0000 NOT 44040	dynamic performance characteristics interactive units of a coal-gasific	
[DE81-028232] p	0029 N82-14910	[DE81-028995]	p0094 N82-10259
An integrating sphere based on absolut	e method for	Transient catalytic combustor model	-
measuring sclar absorptance	0058 182-16247	[NASA-CR-165324] STRAN	p0142 N82-13507
SPHEROMAKS	70030 802 10247	The development and design of steam/	water solar
The tilting mode in field-reversed con		receivers for commercial application	
stability of toroidal plasma equ	0121 A82-11131	[ASME PAPER 81-SOL-4] Energy recovery from municipal waste	p0042 A82-10972 development
SPILLING	•	program for Idaho Falls, Idaho	_
Pollution of the soil by aviation gasc [PML-1979-41] p	:line :0032	[DE81-029999] STEAN FLON	p0028 N82-14659
Three-dimensional, finite elemental mo		One-dimensional model of wapor-domination	ated
simulating heavier-than-air gaseous	releases	geothermal systems	0000 100 44000
over variable terrain [DE81-028689] p	0032 N82-15602	Field demonstration of the convention	p0089 A82-11033 nal steam
SPRAYED COATINGS		drive process with ancillary mater	
Spectrally selective copper sulphide of		[DB81-026849]	p0115 N82-14522
SPRA TERS	0040 A82-10468	Field demonstration of the convention drive process with ancillary mater	
Safety and technical optimization of b		[DE81-026962]	p0115 N82-14523
points with special consideration for suppression of novious and explosive		STEAM TURBINES Analysis of power, mass, and size pa	rameters of
in coal plants	: dusts	solar vapor-turbine two-circuit sy	
	0096 N82-10279	organic working bodies	-0000 100 44004
SPRAYING Experimental demonstration of the feas	ibility of	Dynamic performance analysis for the	p0044 A82-11421 solar hybrid
the Hist Flow Ocean Thermal Energy F	Process	repowering of the El Paso Electric	
[AIAA PAPER 81-2596] p SPUTTERING	0136 A82-18220	Newman Unit No. 1	p0048 A82-11802
Effect of metal base layer on the abso	rptance and	Thermionic combustor application to	
emittance of sputtered graded metal-	carbon	and steam turbine power plants	
selective absorbing surfaces	0040 A82-10469	Preliminary evaluation of advanced c	p0124
Sputtered thin film electrodes for		electricity-generating technologie	
photoelectrochemical cells	0055 482-15111	system-integration analysis [DE81-029989]	p0105 N82-11573
Sputter etched metal solar selective a		Project DEEP STEAM: Fourth meeting	
surfaces for high temperature therma		technical advisory panel	-04## NOO 45564
Investigation of photovoltaic mechanis	00057 A82~16057	[DE81-029457] STILLS	p0144 N82-15561
polycrystalline thin-film solar cell	ls	Thermal performance of a solar still	
[DE81-027272] p	00065 N82-10539	Alcohol fuels grant program at Linco	p0058 A82-16229
FGDIS primer: Major equipment/compone	ent	Community College, Springfield, Il	
classifications, problem/solution ac		[DE82-000744] STIRLING CYCLE	p0114.N82-14375
and definitions related to FGD system contained in the Flue Gas Desulfurize		Ground-mounted thermal storage for t	he parabolic
Information System (FGDIS)		dish solar collector/Stirling engi	ne system
[PB81-225948] p	0016 N82-11985	Overview of DOE's large stationary S	p0047 A82-11781 tirling engine
Performance testing and rating standar	ds for Wind	development program	
Energy Conversion Systems		- ·	p0123 A82-11805
Passive/hybrid solar components: An a	0135 A82-17646	Conceptual design of a large coal-fi Stirling engine	red stationary
standard thermal test methods	.FF.odon to		p0123 A82-11806
	0077 N82-13549	Conceptual design of 500 to 3000 hp	
STANDARDS Standards application and development	plan for	engines for stationary power gener	ation p0123 A82-11807
solar thermal technologies	-	Development free-piston Stirling tes	t-bed engine
[DE81~030310]	0065 N82-10534		p0123 A82-11808

Modelling of the jet-stream Pluidyne p0124 A82-11812	Stratigraphy and depositional history of the Iola Limestone Upper Pennsylvanian (Missourian),
High performance solar Stirling system [AIAA PAPER 81-2554] p0061 A82-18222	Northern Midcontinent U.S. p0116 N82-14711
A computer model of a stirling engine using a two-phase two-component working fluid	Structural evolution of three geopressured-geothermal areas in the Texas Gulf
p0137 N82-10492 Jet impingement heat transfer enhancement for the	Coast
GPU-3 Stirling engine	STRESS ANALYSIS
[NASA-TM-82727] p0140 N82-11993 Test results and facility description for a	Asymmetric stress and failure analysis [DE81-026842] p0142 N82-13451
40-kilowatt stirling engine [NASA-TM-82620] p0141 N82-13013	STRESS CORROSION Practure mechanics of cellular glass
Dish stirling solar receiver combustor test program [NASA-CR-165017] p0076 N82-13495	[NASA-CR-164959] p0066 N82-11209 STRESS RELAXATION
STOICHIOMETRY	Relaxation of geothermal-reservoir stresses
Testing and evaluation of MHD materials and substructures	induced by heat production [DE81-032024] p0105 N82-11715
[DE81-024331] p0143 N82-13926 STORAGE	STRINGS Project DEEP STEAM: Pourth meeting of the
Solar project description for Public Service Company of New Mexico (lct 7) single family	technical advisory panel [DE81-029457] p0144 R82-15561
residence, Rio Rancho, New Mexico [DE81-027853] p0063 N82-10509	STRIP MINING Investigation of the application of remote sensing
STORAGE BATTERIES	technology to environmental monitoring
Effect of depth of discharge on cycle life of near-term batteries	STRONTION TITANATES
p0153 A82-11714 Ampere-hour integrator battery charge controller	Photocorrosion of strontium titanate photoanodes p0057 A82-16056
p0153 A82-11737 NASA preprototype redox storage system for a	STRUCTURAL ABALYSIS Application of orthotropic plate theory to
photovoltaic stand-alone application p0153 A82-11774	windmill blade design p0121 A82-10978
The new batteries p0154 A82-13325	STRUCTURAL BASINS Comparison of Michigan Basin crude oils
Rechargeable lithium/wanadium oxide cells	p0091 A82-17007
utilizing 2Me-THP/LiAsF6 p0154 A82-15726	Petroleum goology and resource assessment of the middle Campian Basin, USSR, with special
Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries	emphasis on the U2en field [DE81-029951] p0104 N82-11518
p0155 A82-15727 Status of the DOE battery and electrochemical	Planning a comprehensive program for exploration of the anthracite deposits of the Narragansett
technology program 2 [DE81-029879] p0156 N82-10540	Basin of Massachusetts and Rhode Island, phase 1 and 2
Rapid charging of lead-acid batteries for electric-vehicle propulsion and solar-electric	[DE81-028490] p0104 N82-11519 STRUCTURAL DESIGN
storage	AAI Corporation receiver design experience in
[DE81-028084] p0157 N82-10548 Recent progress in lithlum/iron sulfide battery	CONCENTRATING SOLAR COLLECTORS [ASHE PAPER 81-SOL-1] p0041 A82-10969
development [DE81-023127] p0157 N82-10557	Design and testing of a uniformly illuminating nontracking concentrator
Status of nickel/zinc and nickel/iron battery technology for electric vehicle applications	p0042 A82-11209 Heat pipes for NEP spacecraft radiators
[DE81-023572] p0157 N82-10962 Calcium/metal sulfide battery development program	p0122 A82-11748 Establishment of noise acceptance criteria for
[ANL-81-14] p0158 N82-11578 Energy storage systems for terrestrial solar	wind turbines p0125 A82-11825
generators cadmium/mercury oxide cells [BMFT-PB-T-81-082] p0080 N82-15529	Optimus reinforcement shapes and paths for rotating composite shells
STORAGE STABILITY Stability of n-i-p amorphous salicon solar cells	p0154 A82-14513
p0043 A82-11343	MHD generator scaling analysis for baseload commercial power plants
Technical and economic aspects of hydrogen storage <pre>in metal hydrides</pre>	[AIAA PAPER 82-0394] p0135 A82-17922 Water-pumping-windmall designs: A handbook
[NASA-TM-76610] p0086 N82-11223 The storage of hydrogen in the form of metal	[DE81-904016] p0137 N82-10536 Magnetohydrodynamic research program of the MHD
hydrides: An application to thermal engines [NASA-TM-76609] p0086 N82-11225	Energy center at Mississippi State University and structural features of MHD radiant boilers
Reservoir stability studies [DE81-030099] p0160 N82-15510	[DE81-029901] p0139 N82-11934 Flexibilities in passive design: Examining some
STORAGE TABES	limiting sclar myths
The storage of hydrogen p0085 A82-17130	[DE81-028401] p0073 B82-12623 DOE small-hydropower demonstration program
Controls for solar heating and cocling [DE81-025209] p0070 B82-11593	[DE81-027819] p0020 N82-12636 STRUCTURAL DESIGN CRITERIA
Compressed-air energy-storage technology: Program overview	High performance sılicon solar arrays employing advanced structures
[DE81-030103] p0160 N82-15548 STRATIFIED PLOW	p0045 A82-11758 Development of high-performance, high-reliability
One-dimensional model of vapor-dominated	windpower generators
geothermal systems p0089 A82-11033	p0134 A82-17640 Barth shelter 2. 1979-1980 USC series
STRATIGRAPHY Geologic considerations in underground coal mining	[CONF-800438] p0006 N82-10277 Hagnetobydrodynamics MHD Engineering Test Facility
system design [NASA-CR-164961] p0104 N82-11516	ETF 200 MWe power plant. Conceptual Design Engineering Report CDER. Volume 3: Costs and
	schedules [NASA-CR-165452-VOL-3] p0137 N82-10495
	grow and to the

n 1 1	
Designing process wells for an underground coal-gasification environment	SULFUR OXIDES An experimental study of SO3 dissociation as a
[DB81-028434] p0108 H82-12264	mechanism for converting and transporting solar
Magnetohydrodynamics (MHD) Engineering Test	energy
Pacility (ETF) 200 MWe power plant. Design	p0043 A82-11214
Requirements Document (DEC) [NASA-TM-82705] p0140 N82-12446	Solar hydrogen system design considerations p0084 A82-11788
Pailure modes and effects analysis of a	Sulfur in the air in the capital (Helsinki)
coal-slurry preheater	metropolitan area: ITASAT-project
[DE81-030425] p0117 #82-15221	[RR-614.71] p0025 N82-13553
STRUCTURAL BEGINERRING	Process for removing sulfur oxides from gases with
MASEC SOLAR 80 home designs	direct production of a usable finished reaction
[DB81-028344] p0067 882-11316 STRUCTURAL FAILURE	product ammonium sulfate fertilizer [BMFT-FB-T-81-102] p0029 N82-15142
An overview of fatigue failures at the Rocky Flats	Coal resources and sulphur emission regulations:
Wind System Test Center	A summary of 8 eastern and midwestern states
p0125 182-11828	[PB81-240319] p0031 N82-15514
Designing process wells for an underground	SULPURIC ACID
coal-gasification environment [DE81-028434] p0108 H82-12264	Sulfur pollution control. Phase 1: The disposal
Asymmetric stress and failure analysis	program [PB81-222612] p0014 N82-11652
[DE81-026842] p0142 N82-13451	Oxydesulfurization of coal by acidic iron sulfate
STRUCTURAL PROPERTIES (GROLOGY)	solutions
Structural evolution of three	[DE82-000464] p0106 N82-12199
geopressured-geothermal areas in the Texas Gulf	SUMMER
Coast [DB81-027799] p0118 N82-15505	Summertime results from the class B passive-solar performance-monitoring program
STRUCTURAL RELIABILITY	[DE81-025471] p0074 N82-12627
Method of determining the creep characteristics of	SUPERCONDUCTING MAGNETS
composite materials	Conceptual design of superconducting magnet system
p0154 A82-11779	for Magnetohydrodynamic (MHD) Engineering Test
STRUCTURAL STRAIN A review of rain erosion problems for aerogenerators	Pacility (ETF) 200 MWe power plant [NASA-CR-165053] p0143 N82-14520
p0130 A82-14356	[NASA-CR-165053] p0 143 N82-14520 SUPERCONDUCTING POWER TRANSMISSION
STRUCTURAL VIBRATION	A design for an fill power plant as a prime mover
An overview of fatigue failures at the Rocky Plats	for a Naval Vessel
Wind System Test Center	[AIAA PAPER 81-2575] p0129 A82-14032
p0125 A82-11828	Cryogenic testing of 100-m superconducting power
Enertech High Reliability prototype vibration analysis	transmission test facility [DE81-028331] p0150 N82-13517
p0133 A82-17635	Improved technique to measure electronically AC
SUBROUTINES	losses in superconducting cables
Tennessee Valley Authority atmospheric	[DE81-029323] p0150 N82-15338
fluidized-bed combustor simulation	SUPERCONDUCTORS
[DE81-030262] p0098 N82-11151 SUBSIDENCE	Ames Laboratory research report, 1980 [DE81-027399] p0161 N82-11012
Computer models to support investigations of	SUPERHIGH FREQUENCIES
surface subsidence and associated ground motion	K/u/-band flat-profile S1-IMPATT diodes with
induced by underground coal gasification	10-percent efficiency
[DE81-027131] p0015 N82-11712	p0058 A82-16132
SUBSTRATES Transient catalytic combustor model	SUPPLYING Microprocessor applications for the monitoring and
[NASA-CR-165324] p0142 N82-13507	control of gas supplies
SUGAR CAME	[EBS-E-276] p0097 N82-10735
Studies on sugarcane as an energy crop for Punjab	Electric power supply and demand for the
[PB81-2323C8] p0115 N82-14386	contiguous United States, 1981 - 1990
SULFATES Directly cylinter in particulate matter from coal-	[DE81-027126] p0012 N82-11376
Dimethyl sulfate in particulate matter from coal- and oil-fired power plants	SURFACE DEFECTS Photovoltaic mechanisms in polycrystalline thin
p0005 A82-16199	film silicon solar cells
Solid-solid reactions in coal conversion processes	[DE81-U30370] p0072 N82-12608
p0107 N82-12238	SURPACE DISTORTION
SULPITES	Thermal deformation of concentrators in an
Sulfur pollution control. Phase 1: The disposal program (sections 5 through 7)	antisymmetric temperature field
[PB81-222804] p0015 N82-11655	18648 - 187 - 1900 - 19
	p0062 A82-18698 SURFACE BEERGY
SULPONIC ACID	
SULPORIC ACID Evaluation of organic acids as fuel cell	SURFACE EMERGY Zn3P2 as an improved semiconductor for photovoltaic solar cells
Evaluation of organic acids as fuel cell electrolytes	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] p0069 N82-11577
SULPORIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A62~12938	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURFACE PROPERTIES p0069 N82-11577
SULPORIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] p0069 N82-11577 SURFACE PROPERTIES Surface and interface studies and the stability of
SULPORIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A62~12938	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURFACE PROPERTIES P0069 N82-11577
SULPONIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844	SURPACE EBERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURFACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials P0037 A82-10010 An integrating sphere based on absolute method for
SULPONIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULPUR DIOXIDES	SURPACE EMERGY 2n3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SUBFACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials An integrating sphere based on absolute method for measuring solar absorptance
SULPONIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUN The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULFUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURFACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials p0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance p0058 A82-16247
SULPONIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPON The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULPOR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] p0069 N82-11577 SURPACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials p0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance p0058 A82-16247 Separation of particles from coal derived liquids
SULPORIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULFUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 A computer simulation modeling study to predict	SURPACE EMERGY 2n3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SUBFACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials P0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Separation of particles from coal derived liquids via surface charge properties [DE81-029088] P0092 N82-10141
SULPONIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULPUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURFACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials p0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance p0058 A82-16247 Separation of particles from coal derived liquids via surface charge properties [DE81-029088] p0092 N82-10141 Tertiary oil recovery processes research at the
Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULFUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULFUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired power plant	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] p0069 N82-11577 SURPACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials p0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance p0058 A82-16247 Separation of particles from coal derived liquids via surface charge properties [DE81-029088] p0092 N82-10141 Tertiary oil recovery processes research at the University of Texas
SULPONIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULPUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired power plant p0020 M82-12650	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURPACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials P0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Separation of particles from coal derived liquids via surface charge properties [DE81-029088] Tertiary oil recovery processes research at the University of Texas [DE81-025222] P0096 N82-10477
SULPORIC ACID Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULPUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired power plant p0020 M82-12650 Kinetics of reactions in a wet flue gas	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURPACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials P0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Separation of particles from coal derived liquids via surface charge properties [DE81-029088] P0092 N82-10141 Tertiary oil recovery processes research at the University of Texas [DE81-025222] P0096 N82-10477 Spectra over complex terrain
Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULFUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired power plant p0020 M82-12650 Kinetics of reactions in a wet flue gas simultaneous desulfurization and denitrification system	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURPACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials P0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Separation of particles from coal derived liquids via surface charge properties [DE81-029088] Tertiary oil recovery processes research at the University of Texas [DE81-025222] P0096 N82-10477
Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULPUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired power plant p0020 M82-12650 Kinetics of reactions in a wet flue gas simultaneous desulfurization and denitrification system [DE81-029853] p0033 M82-15607	SURPACE EMERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURPACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials P0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Separation of particles from coal derived liquids via surface charge properties [DE81-029088] Tertiary oil recovery processes research at the University of Texas [DE81-02522] Spectra over complex terrain [DE81-028734] SURFACE ROUGHWESS The effect of rotor blade thickness and surface
Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULFUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULFUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired power plant p0020 M82-12650 Kinetics of reactions in a wet flue gas simultaneous desulfurization and denitrification system [DE81-029853] p0033 M82-15607 Use of coal cleaning for compliance with S02	SURPACE EBERGY Zn3P2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURFACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials An integrating sphere based on absolute method for measuring solar absorptance p0058 A82-10247 Separation of particles from coal derived liquids via surface charge properties [DE81-029088] Tertiary oil recovery processes research at the University of Texas [DE81-025222] Spectra over complex terrain [DE81-028734] SURFACE BUGGHESS The effect of rotor blade thickness and surface finish on the performance of a small axial flow
Evaluation of organic acids as fuel cell electrolytes p0127 A82-12938 SULPUR The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 SULPUR DIOXIDES Improved efficiency in the sulfur dioxide - Iodine hydrogen cycle through the use of magnesium oxide p0083 A82-11784 A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired power plant p0020 M82-12650 Kinetics of reactions in a wet flue gas simultaneous desulfurization and denitrification system [DE81-029853] p0033 M82-15607	SURPACE EBERGY Zn3F2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] SURPACE PROPERTIES Surface and interface studies and the stability of solid solar energy materials P0037 A82-10010 An integrating sphere based on absolute method for measuring solar absorptance P0058 A82-16247 Separation of particles from coal derived liquids via surface charge properties [DE81-029088] Tertiary oil recovery processes research at the University of Texas [DE81-02522] Spectra over complex terrain [DE81-028734] SURFACE ROUGHWESS The effect of rotor blade thickness and surface

SURFACE STABILITY	Alternative ocean energy products and hybrid
Surface and interface studies and the stability of	geothermal-OTEC /GEOTEC/ plants
solid solar energy materials	[AIAA PAPER 81-2547] p0128 A82-14012
p0037 A82-10010	Soot formation in synthetic fuel droplets
SURPACE VEHICLES	[DE81-028391] p0092 N82-10150
Characteristics and trends of energy consumption	Synthetic-fuel combustion; pollutant formation.
in transport missions with aircraft and surface	Soot-initiation mechanisms in burning aromatics
v ehicles	[DE81-029480] p0093 H82+10155
p0001 A82-10495	Bigh-mass-flux coal gasifier
Alternative transportation vehicles for	[DE81-029807] p0094 N82-10257
military-base operations	Soot formation in synfuels
p0005 A82-16348	[DE81-030273] p0099 N82-11164
SURPACE WATER	Outgassing of two synthetic fuels
Coal liquefaction demonstration plant near	[AD-A104580] p0100 N82-11231
Morgantown, West Virginia; water assessment	Alternative fuel for the steel industry of
report section 13(b)	Northern Indiana: A prefeasibility study of a
[PB81-216095] p0103 N82-11269	central coal gasification project
Coal liquefaction demonstration plant near	[DB81-029314] p0010 N82-11233
Morgantown, West Virginia: Water assessment	Effects of components of synfuels on soot formation
report	[DE81-027961] p0101 N82-11242
[PB81-216103] p0011 N82-11270	Advanced-gasification processes
Bibliography of the seasonal thermal energy	[DE81-030184] p0102 882-11254
storage library	Pusion as a source of synthetic fuels
[DE81-030470] p0159 N82-12586	[BNL-29281] p0086 N82-11257
Spectra over complex terrain	Transportation fuels from synthetic gas
[DE81-028734] p0112 N82-13473	[DB81-029614] p0102 B82-11258
SURFACTANTS	Synthetic fuel development for the Upper Missouri
Ion exchange characteristics of enhanced oil	River Basin. Section 13: Water assessment report
recovery systems (miscibility studies)	[PB81-224537] p0011 N82-11276
[DE81-769734] p0096 N82-10478	Status of the Great Plains coal gasification plant
Microemulsions, emulsions and related systems:	
Energy applications	Development of catalytic systems for the
p0113 N82-13545	conversion of syngas to jet fuel and diesel fuel
SWIRLING	and higher alcohols
Characteristics of combustion and pollutant	[DB82-000067] p0108 N82-12255
formation in swirling flames	Synthesis gas conversion to liquid fuels using
p0001 A82-10875	promoted fused iron catalysts
Plow aerodynamics modeling of an MHD swirl	[DE81-030857] p0108 N82-12259
combustor - Calculations and experimental	Development of hydroconversion of biomass to
verification	synthetic fuels
p0127 A82-12113	[DE81-030954] p0108 N82-12260
SWITCHING CIRCUITS	LOW NO sub x heavy fuel combustor concept program
High power solar array switching regulation	[NASA-CR-165512] p0140 N82-12572
p0045 A82-11736	Development of testing procedures and
Series vs. shunt regulators for power control in	bibliographic information relevant to the
satellite power systems	testing of solid wastes resulting from synthetic
p0045 A82-11738	fuels production
Increasing power and efficiency by dynamic	[DE81-030822] p0020 N82-12661
suppression of ionization instability in a plasma	Development of testing procedures and
p0127 A82-12897	bibliographic information relevant to the
SYNCHRONOUS SATELLITES	testing of solid wastes resulting from
Effects of the Satellite Power System on low Earth	synthetic-fuels production
orbit and geosynchronous satellites	[DE81-030671] p0021 N82-12673
[PB81-232019] p0150 N82-13157	Barriers to the utilization of synthetic fuels for
Synthaue	transportation
Assessment of potential future markets for the	[NASA-CR-165517] p0023 N82-13243
production of hydrogen from water	Peasibility study report for the Imperial Valley
[BMFT-FB-T-81-012] p0086 N82-12266	Ethanol Refinery: A
SYNTHESIS (CHEMISTRY)	14.9-million-gallon-per-year ethanol synfuel
Selectivity in Pischer-Tropsch synthesis: Review	refinery utilizing geothermal energy
and recommendations for further work	[DE82-000288] p0112 N82-13252
[PB81-223596] p0095 H82-10271	Potential supply of synthetic fuels from Alaskan
Catalyst and reactor development for a	hydroelectric power and coal
liquid-phase fischer-tropsch process	[DE81-025743] p0114 N82-14381
[DE81-028209] p0099 N82-11168	Carcinogenic effects of coal-conversion materials
An assessment of nonfossil hydrogen	
an assessment of nontossii nydrogen	[DE81-028108] p0029 N82-14803
[PB81-246522] p0087 N82-15231	Improved polymers for enhanced oil recovery
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS	Improved polymers for enhanced oil recovery synthesis and rheology
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels	Improved polymers for enhanced oil recovery
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM RFFECTIVENESS
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM EFFECTIVENESS Dynamic performance analysis for the solar hybrid
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Fingerprinting pollutant discharges from synfuels plants plants p0001 A82-10697 Factors in the development of a major US synthetic	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM RFFECTIVENESS
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Fingerprinting pollutant discharges from synfuels plants plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry	Improved polymers for enhanced oil recovery synthesis and rheology [DB81-030194] p0118 N82-15509 SYSTEM RPPECTIVENESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM EFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Fingerprinting pollutant discharges from synfuels plants plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM EFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Fingerprinting pollutant discharges from synfuels plants pound A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM EFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Fingerprinting pollutant discharges from synfuels plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM EFFECTIVENESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SISTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Riectric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SISTEMS
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Fingerprinting pollutant discharges from synfuels plants plants pound A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SYSTEMS Atmospheric fluidized-bed projects technology
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants pound A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification p0089 A82-11848	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SYSTEMS Atmospheric fluidized-bed projects technology overview
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification p0089 A82-11848 Production of synthetic crude oil from coal using	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Riectric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SYSTEMS Atmospheric fluidized-bed projects technology overview [DE81-027143] p0102 N82-11251
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOE Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification p0089 A82-11848 Production of synthetic crude oil from coal using the TOSCOAL pyrclysis process	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Hewman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SYSTEMS Atmospheric fluidized-bed projects technology overview [DE81-027143] p0102 E82-11251 SYSTEMS ANALYSIS
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants plants plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification P0089 A82-11848 Production of synthetic crude oil from coal using the TOSCOAL pyrclysis process p0090 A82-11849	Improved polymers for enhanced oil recovery synthesis and rheology [DB81-030194] p0118 N82-15509 SYSTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SYSTEMS Atmospheric fluidized-bed projects technology overview [DB81-027143] p0102 N82-11251 SYSTEMS AHALYSIS Cycle and performance analysis of absorption heat
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification Production of synthetic crude oil from coal using the TOSCOAL pyrclysis process p0090 A82-11849 U.S. Department of Energy liquid synfuels overview	Improved polymers for enhanced oil recovery synthesis and rheology [DB81-030194] p0118 N82-15509 SYSTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SYSTEMS Atmospheric fluidized-bed projects technology overview [DB81-027143] SYSTEMS AHALYSIS Cycle and performance analysis of absorption heat pumps for waste heat utilization
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification p0089 A82-11848 Production of synthetic crude oil from coal using the TOSCOAL pyrclysis process p0090 A82-11849 U.S. Department of Energy liquid synfuels overview p0090 A82-12531	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SISTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Riectric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SISTEMS Atmospheric fluidized-bed projects technology overview [DE81-027143] p0102 N82-11251 SISTEMS AHALISIS Cycle and performance analysis of absorption heat pumps for waste heat utilization [DE81-030705] p0103 N82-11405
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification p0089 A82-11848 Production of synthetic crude oil from coal using the TOSCOAL pyrclysis process p0090 A82-11849 U.S. Department of Energy liquid synfuels overview p0090 A82-12531 Biomass resources for alcohol fuels	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Hewman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SYSTEMS Atmospheric fluidized-bed projects technology overview [DE81-027143] p0102 H82-11251 SYSTEMS ANALYSIS Cycle and performance analysis of absorption heat pumps for waste heat utilization [DE81-030705] p0103 N82-11405 System performance conclusions
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification Production of synthetic crude oil from coal using the TOSCOAL pyrclysis process p0090 A82-11849 U.S. Department of Energy liquid synfuels overview p0090 A82-12531 Biomass resources for alcohol fuels	Improved polymers for enhanced oil recovery synthesis and rheology [DB81-030194] p0118 N82-15509 SYSTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Newman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SYSTEMS Atmospheric fluidized-bed projects technology overview [DB81-027143] p0102 N82-11251 SYSTEMS AHALYSIS Cycle and performance analysis of absorption heat pumps for waste heat utilization [DE81-030705] p0103 N82-11405 System performance conclusions
[PB81-246522] p0087 N82-15231 SYNTHETIC FORLS Pingerprinting pollutant discharges from synfuels plants p0001 A82-10697 Factors in the development of a major US synthetic fuels industry p0001 A82-11543 Status report on Central Maine Power Company's DOB Funded feasibility study of the Sears Island integrated gasification combined cycle power plant p0089 A82-11835 An overview of peat gasification p0089 A82-11848 Production of synthetic crude oil from coal using the TOSCOAL pyrclysis process p0090 A82-11849 U.S. Department of Energy liquid synfuels overview p0090 A82-12531 Biomass resources for alcohol fuels	Improved polymers for enhanced oil recovery synthesis and rheology [DE81-030194] p0118 N82-15509 SYSTEM RFFECTIVEMESS Dynamic performance analysis for the solar hybrid repowering of the El Paso Electric Company Hewman Unit No. 1 p0048 A82-11802 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14014 SYSTEMS Atmospheric fluidized-bed projects technology overview [DE81-027143] p0102 H82-11251 SYSTEMS ANALYSIS Cycle and performance analysis of absorption heat pumps for waste heat utilization [DE81-030705] p0103 N82-11405 System performance conclusions

photovoltaic systems: Utility

Systems analysis of thermal storage [DE81-030288] p0079 N82-14658 SYSTEMS REGIMERRIEG	SYSTEMS STABILITY Distributed ph interface is
Power management of multi-hundred kilowatt spagecraft power systems	[NASA-CR-165
p0046 A82-11769 Microwave power transmission by satellites	
p0145 A82-12503 Mechanical and nonlinear effects in microwave power transmission	TABLES (DATA) International [DE81-028117
p0145 A82-12504 The effect of non-Markovian cloud patterns on the design of a regulator for a solar-powered boiler	TAR SANDS Bibliography o [DE81-026146
Plorida's proposed OTEC pilot plant for Key West	TARS Carcinogenic e
[AIAA PAPEK 81-2563] p0003 A82-14021 The transformation of wind energy by a high altitude power plant /HAPP/	DE81-028108 TEARING MODE (PLA Nonlinear deve
[AIAA PAPER 81-2568] p0128 A82-14025 OTEC ocean system develorment	the tearing- geometries
[AIAA PAPER 81-2590] p0130 A82-14038 Carbonate fuel cell power plant systems	TECHNOLOGICAL FOR
p0131 A82-15069 Wind energy conversion system design and analysis program	Energy future: Proceedings Conference o
p0133 A82-17630 High performance sclar Stirling system	Bissouri-Rol Volume 7
[AIAA PAPER 81-2554] p0061 A82-18222 Preliminary design study of underground pumped	Contributions
hydro and compressed-air energy storage in hard rock. Volume 9: Design approaches, CAES. Appendix D: Mechanical systems	food product energy suppl
[DB81-028200] p0156 N82-10530 Intermediate photovoltaic-system application	Fuel conservat airways - A
experiment operational performance report.	future devel
Volume 1: For Lovington Square Shopping Center site, Lovington, New Mexico	Energy for the
[DE81-028971] p0065 N82-10543 Solar photovoltaic system engineering perspectives	Energy end-use
[DE81-023179] p0066 N82-10570 Conceptual design for a multi-user medium BTU coal gasification complex. Volume 1: Executive summary	volume 3 [DE81-027976 TECHNOLOGIES Surface coal g
[DE81-027139] p0101 N82-11238 DOE solar-assisted heat-rump program: Its evolution and its potential	[DE81-030183 TECHNOLOGY ASSESS Waves of energ
[DE81-026055] p0067 N82-11413 Seclogic considerations in underground coal mining	Annual review
system design [NASA-CR-164961] p0104 N82-11516	Solar energy t
iagnetohydrodynamics (MHD) Engineering Test	Factors in the
Facility (ETF) 200 MWe power plant. Design Requirements Document (DED)	fuels indust
[NASA-TM-82705] p0140 N82-12446 Design and breadboard evaluation of the SPS	Intersociety E
reference phase control system concept p0072 N82-12545	Conference, 1981, Procee
<pre>Plexibilities in passive design: Examining some limiting solar myths</pre>	Development st
[DE81-028401] p0073 N82-12623 Solar project at Almeria nears completion	system for o
p0075 N82-12647 Seminars for private college administrators on	The AGT101 tec
solar applications for college buildings [DE81-027981] p0079 N82-14661	Review of elec storage for
Development of a prototype of a 10 kW small solar power plant technology for developing nations [BMPT-FB-T-81-101] p0080 N82-15532	Nuclear reacto conversion s
Technology of controlled nuclear fusion [DE81-027361] p0144 N82-15893	The new batter
SYSTEMS INTEGRATION Control of new energy sources in an electric	Potential dyna
utility system p0154 A82-13082 Assessment of MHD power plants with coal	utility syst The all-electr
gasification [AIAA PAPER 81-2574] p0129 A82-14030	SWECS technolo
SYSTEMS SIMULATION Cost estimates for advanced/innovative wind energy	goals Sm
conversion systems /AWECS/ [AIAA PAPER 81-2557] p0128 A82-14016	Status of the components f
Electric utility modeling extensions to evaluate solar plants	State of the a
p0061 A82-18025 Energy analysis sample building data	[LA-UR-81-21 Near-term batt
[DE81-027188] p0011 N82-11318 Solar heat pump simulator	[DE81-023543 Assessment of
f DE81-0243681 poo70 N82-11583	[NASA-CR-164

issues and their present status 1650191 p0076 N82-13492 al energy indicators p0028 N82-14653 y of publications dealing with tar sands p0115 N82-14594 1461 c effects of coal-conversion materials 108] p0029 N82-14803 PLASHAS) evelopment of magnetic reconnection in ng-type and the Petschek-type field PORECASTING re: Prophets, profits and policies; gs of the Seventh Annual UMR-DNR e on Energy, University of Rolla, Rolla, MO, October 14-16, 1980. p0002 A82-12547 ns of space reflector technology to uction, local weather manipulation and pply, 1985-2020 p0054 A82-14445 vation measures in South African A review of activity and a glimpse of velopments p0004 A82-15598 the year 2000 --- Book p0006 A82-18120 use requirements in manufacturing, 9761 D0007 N82-10544 l gasification p0102 N82-11253 183] ESSMENT erav p0121 A82-10450 ew of energy. Volume 6 --- Book p0001 A82-11540 y technology - A five-year update p0044 A82-11541 the development of a major US synthetic ustry p0001 A82-11543 y Energy Conversion Engineering e, 16th, Atlanta, GA, August 9-14, ceedings. Volumes 1, 2 & 3 p0121 A82-11701 status of a regenerative fuel cell r orbital operation p0153 A82-11707 technology - An automotive alternative p0123 A82-11783 lectrochemical energy conversion and or ocean thermal and wind energy systems p0126 A82-11832 ctor closed Brayton cycle space power n systems p0126 A82-11840 teries p0154 A82-13325 ynamic impacts of wind turbines on p0131 A82-15071 ctric airplane - A new trend p0006 A82-17420
ology - State-of-the-art and achievable Small Wind Energy Conversion Systems p0134 A82-17644 he microwave power transmission s for the solar power satellite p0 146 A82-17982 e art in passive solar heating p0065 N82-10537 -2185] atteries for electric vehicles p0157 N82-10556 of advanced coal gasification processes
1649491 p0098 N82-11146 164949]

TECHNOLOGY TRANSPER SUBJECT INDEX

Jet fuel locks to shale oil: The 1980 technology	Photovoltaics, the solar electric solution
review [AD-A104414] p0100 H82-11228	p0050 A82-12532 Industrial applications of MHD high temperature
Low/medium-Btu coal-gasification assessment	air heater technology
program for specific sites of two New York	[AIAA PAPER 81-2588] p0130 A82-14037
utilities [DB81-025518] p0101 B82-11240	Technological innovation for success - Liquid hydrogen propulsion
Assessment of oil-shale technology in Brazil	p0084 A82-16734
[DE81-027574] p0010 N82-11249	Possible application of electromagnetic guns to
Atmospheric fluidized-bed projects technology overview	impact fusion p0135 A82-18201
[DE81-027143] p0102 N82-11251	Market assessment of photovoltaic power systems
Advanced-gasification processes	for agricultural applications in Mexico [NASA-CR-165441] p0007 N82-10506
[DE81-030184] p0102 B82-11254 Alcohol fuels in the United States	[NASA-CE-165441] p0007 N82-10506 Environmental compliance program handbook
[DE81-026013] p0010 N82-11265	[DE81-030226] p0008 N82-10585
Gas recovery from coal deposits [PB81-222291] p0103 N82-11271	Investigation of the application of remote sensing technology to environmental monitoring
[PB81-222291] p0103 N82-11271 Mechanical Energy Storage Technology (MEST)	[E82-10010] p0030 N82-15488
development	Technology of controlled nuclear fusion
[DE81-026800] p0158 N82-11596 An assessment of selected solar energy industry	[DE81-027361] p0144 N82-15893 TELEVISION RECEIVERS
activities	Appliance efficiency and the solar building
[PB81-222424] p0071 N82-11623	[DE81-029073] p0075 N82-13265
Assessment of pulverized-coal-fired combustor performance	TELLURIC CURRENTS Geomagnetic and magnetotelluric soundings in the
[DE81-030860] p0105 N82-12187	area of the Central European rift system
Extensible bridge-conveyor concepts for coal-mine face haulage	[BMFT-FB-T-81-111] p0119 N82-15656 TEMPERATURE CONTROL
[DE81-031974] p0146 N82-12525	The effect of non-Markovian cloud patterns on the
Considerations for high accuracy radiation	design of a regulator for a solar-powered boiler
efficiency measurements for the Sclar Power Satellite (SPS) subarrays	p0052 A82-13083 TEMPERATURE DEPENDENCE
p0148 N82-12559	The emissivity of metals frequency and
Session on solid state: Introduction p0149 N82-12565	temperature dependence calculations for solar collector design
Utilization of waste heat from major transformer	p0038 A82-10014
substations. Volume 1: Generic study	Temperature dependence of the short-circuit
[DE81-904212] p0019 N82-12593 Utilization of waste heat from major transformer	current in MIS solar cells p0052 A82-12825
substations. Volume 2: Site-specific study	Dependence of minority carrier diffusion length on
[DE81-904236] p0019 N82-12594 Modelling energy-economic interactions in	illumination level and temperature in single crystal and polycrystalline Si solar cells
developing countries: A linear-programming	p0053 A82-13804
approach	TEMPERATURE DISTRIBUTION
[DE81-026048] p0020 N82-12637 Technology characterizations: Environmental	Method for calculating the unsteady temperature conditions of the generator in a solar
information handbook, second edition	refrigeration system
[DE81-029993] p0021 N82-12671 Soviet UCG experience specifically related to	TEMPERATURE EFFECTS p0056 A82-15642
field experiments in the United States	A study of factors influencing thermally induced
[DE81-028642] p0111 N82-13244	backfiring in hydrogen fueled engines, and
Distributed photovoltaic systems: Utility interface issues and their present status	methods for backfire control . p0084 A82-11791
[NASA-CR-165019] p0076 N82-13492	Effect of wick dryness on the performance of heat
Health and safety research division [DE81-026088] p0026 N82-13652	pipes with separate channels p0005 A82-16272
Study of multi-megawatt technology needs for	Thermal deformation of concentrators in an
photovoltaic space power systems. Volume 1:	antisymmetric temperature field
Executive summary [NASA-CR-165323-VOL-1] p0078 N82-14636	p0062 A82-18698 TEMPERATURE GRADIENTS
Study of multi-megawatt technology needs for	
photovoltaic space power systems, volume 2 [NASA-CR-165323-VOL-2] p0078 N82-14637	Experimental demonstration of the feasibility of
[1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	the Mist Flow Ocean Thermal Energy Process
Potential energy savings in the residential sector	
of the United States	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas
of the United States [DE81-028873] p0028 N82-14662	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684
of the United States [DE81-028873] p0028 N82-14662 [DE81-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for
of the United States [DE81-028873] US ceramic heat exchanger technology: Status and opportunities [DE81-029686] p0030 N82-15210	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array
of the United States [DE81-028873] p0028 N82-14662 [DE81-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528
of the United States [DE81-028873] US ceramic heat exchanger technology: Status and opportunities [DE81-029686] Micro-hydropower in the United States [DE81-028271] Technology of controlled nuclear fusion	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS
of the United States [DE81-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [DE81-029686] p0030 N82-15210 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 Technology of controlled nuclear fusion [DE81-027361] p0144 N82-15893	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for
of the United States [DE81-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [DE81-029686] p0030 N82-15210 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 Technology of controlled nuclear fusion [DE81-027361] p0144 N82-15893 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for determining reliable solar-collector-array performance
of the United States [DE81-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [DE81-029686] p0030 N82-15210 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 Technology of controlled nuclear fusion [DE81-027361] p0144 N82-15893 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528
of the United States [DE81-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [DE81-029686] p0030 N82-15210 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 Technology of controlled nuclear fusion [DE81-027361] p0144 N82-15893 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TENNESSEE Evaluation of Devonian shale potential in eastern
of the United States [D881-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [D881-029686] p0030 N82-15210 Micro-hydropower in the United States [D881-028271] p0031 N82-15567 Technology of controlled nuclear fusion [D881-027361] p0144 N82-15893 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [D881-904246] p0035 N82-16012 TECHNOLOGY TRANSFER Overview of the applied battery and	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TENNESSEE Evaluation of Devonian shale potential in eastern Kentucky/Tennessee
of the United States [DB81-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [DB81-029686] p0030 N82-15210 Micro-hydropower in the United States [DB81-028271] p0031 N82-15567 Technology of controlled nuclear fusion [DB81-027361] p0144 N82-15893 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DB81-904246] p0035 N82-16012 TECHNOLOGY TRANSFER	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TENNESSEE Evaluation of Devonian shale potential in eastern
of the United States [D881-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [D881-029686] p0030 N82-15210 Micro-hydropower in the United States [D881-028271] p0031 N82-15567 Technology of controlled nuclear fusion [D881-027361] p0144 N82-15893 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [D881-904246] p0035 N82-16012 TECHNOLOGY TRANSFER Overview of the applied battery and electrochemical research program [D881-027397] TECHNOLOGY UTILIZATION	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TENNESSEE Evaluation of Devonian shale potential in eastern Kentucky/Tennessee [DE82-001164] p0116 N82-14595 TERMINAL FACILITIES Analysis of integrated fuel-efficient, low-noise
of the United States [DE81-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [DE81-029686] p0030 N82-15210 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 Technology of controlled nuclear fusion [DE81-027361] p0144 N82-15893 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] p0035 N82-16012 TECHNOLOGY TRANSFER Overview of the applied battery and electrochemical research program [DE81-027397] TECHNOLOGY UTILIZATION Solar energy technology - A five-year update	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TENNESSEE Evaluation of Devonian shale potential in eastern Kentucky/Tennessee [DE82-001164] p0116 N82-14595 TERNIAL PACILITIES Analysis of integrated fuel-efficient, low-noise procedures in terminal-area operations
of the United States [D881-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [D881-029686] p0030 N82-15210 Micro-hydropower in the United States [D881-028271] p0031 N82-15567 Technology of controlled nuclear fusion [D81-027361] p0144 N82-15893 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [D881-904246] p0035 N82-16012 TECHNOLOGY TRANSFER Overview of the applied battery and electrochemical research program [D881-027397] p0158 N82-11594 TECHNOLOGY UTILIZATION Solar energy technology - A five-year update p0044 A82-11541 Techniques and applications of pulsed power	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TENNESSEE Evaluation of Devonian shale potential in eastern Kentucky/Tennessee [DE82-001164] p0116 N82-14595 TERNINAL PACILITIES Analysis of integrated fuel-efficient, low-noise procedures in terminal-area operations [DE81-029833] p0022 N82-13014
of the United States [DE81-028873] p0028 N82-14662 US ceramic heat exchanger technology: Status and opportunities [DE81-029686] p0030 N82-15210 Micro-hydropower in the United States [DE81-028271] p0031 N82-15567 Technology of controlled nuclear fusion [DE81-027361] p0144 N82-15893 Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] p0035 N82-16012 TECHNOLOGY TRANSFER Overview of the applied battery and electrochemical research program [DE81-027397] p0158 N82-11594 TECHNOLOGY UTILIZATION Solar energy technology - A five-year update p0044 A82-11541	the Mist Flow Ocean Thermal Energy Process [AIAA PAPER 81-2596] p0136 A82-18220 Heat flow studies and geothermal exploration in western Trans-Pecos Texas p0110 N82-12684 TEMPERATURE MEASUREMENT Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TEMPERATURE MEASURING INSTRUMENTS Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 TENNESSEE Evaluation of Devonian shale potential in eastern Kentucky/Tennessee [DE82-001164] p0116 N82-14595 TERMINAL PACILITIES Analysis of integrated fuel-efficient, low-noise procedures in terminal-area operations [DE81-029833] p0022 N82-13014

SUBJECT IBDEX THERMAL MAPPING

southern West Virginia

TEST COULPARNT Method of determining the creep characteristics of composite materials D0154 A82-11779 TEST PACILITIES Correlation between results of zone method and experiment in radiative heat transfer p0121 A82-10958 [ASME PAPER 81-H1-71] A central tower solar test facility /RM/CISTP/ p0048 A82-11797 Evaluation of wind turbine generator operational hysteresis using 'Method of Bins' p0133 A82-17636 End region and current consolidation effects upon the performance of an MBD channel for the ETP conceptual design --- Ergineering Test Facility [AIAA PAPER 82-0325] p0135 A82-17889 Impact of uniform electrode current distribution on ETF --- Engineering Test Facility MHD generator
[AIAA PAPEE 82-0423] p0135 A82-17941
Magnetohydrodynamics MHD Engineering Test Facility
ETF 200 MWe power plant. Conceptual Design
Engineering Report CLER. Volume 3: Costs and schedules [NASA-CR-165452-VOL-3]
Lewis Research Center's coal-fired, pr
fluidized-bed reactor test facility p0137 N82-10495 pressurized, [NA SA-TH-8 16 16] [NASA-TM-81616] p0103 N82-11397 Magnetohydrodynamic research program of the MHD Energy center at Mississippi State University and structural features of MHD radiant boilers [DE81-029901] p0139 N82-11934 Magnetohydrodynamics (MHD) Engineering Test Facility (ETF) 200 MWe rower plant. Design Requirements Document (DED) [NASA-TM-82705] p0140 N82-12446 Residual-energy-application program: facility requirements document, volume 1
[DE81-027536] p0142
Testing and evaluation of MHD materials and p0142 N82-13526 substructures [DE81-024331] p0143 N82-13926 Sixth Underground Coal-Conversion Symposium [DE81-027669]
TETHERED BALLOOMS P0114 N82-14374 The transformation of wind energy by a high altitude power plant /HAPP/ [AIAA PAPER 81-2568] p0128 A82-14025 TREAS Heat flow studies and geothermal exploration in western Trans-Pecos Texas Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 Structural evolution of three geopressured-geothermal areas in the Texas Gulf Coast [DE81-029799] D0118 N82-15505 THERMAL ABSORPTION Fundamental limits to the spectral selectivity of composite materials --- for absorbing solar radiation p0038 A82-10015 Corrosion science and its application to solar thermal energy material problems p0038 A82-10017 Improvement of thermal efficiency of flat plate solar collectors
[BMFT-FB-T-80-194] p0075 N82-12642 THERMAL CONDUCTIVITY Material property data and their use in design and analysis for an elevated temperature solar code p0055 A82-14847 Measurement of thermal conductivities in coal fluids [DE82-000523] p0109 N82-12400 THERMAL DECOMPOSITION Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Solar hydrogen system design considerations p0084 A82-11788 The GA sulfur-rodine water-splitting process - A status report P0084 A82-11844 Experimental evaluation of the steady-state and

dynamic performance characteristics of the interactive units of a coal-gasification process [DE81-028995] p0094 N82-10259

THERMAL DEGRADATION Metallurgical analysis and high temperature degradation of the black chrome solar selective D0060 A82-17252 THERMAL DISSOCIATION Thermolysis of naphthols [DE81-029684] D0116 N82-15152 THERMAL ENERGY Ground-mounted thermal storage for the parabolic dish solar collector/Stirling engine system p0047 A82-11781 Dish concentrators for solar thermal energy Status and technology development [AIAA PAPER 81-2530] p0053 A82-14001 A method for preliminary evaluation and sizing of solar thermal cogeneration system applications [AIAA PAPER 81-2551] p0054 A82-14 p0054 A82-14014 Solar-thermal experimental projects on the Spanish Plataforma Solar p0059 A82-17128 A computer model of a stirling engine using a two-phase two-component working fluid p0137 N82-10492 Cooperative program of applied energy research technology development [DE81-028916] p0007 N82-10517 Review of simulation techniques for Aquifer Thermal Energy Storage (ATES) p0156 N82-10532 [DE81-029943] Standards application and development plan for solar thermal technologies [DE81-030310] p0065 N82-10534 Site And Neighborhood Design (SAND): Development of simplified automated building thermal load procedures, phase 1 [DE81-027138] Analysis of thermal/mechanical energy-conversion concepts [DE81-027854] p0139 N82-11585 Use of solar thermal energy to generate electricity [DE81-028797] p0070 N82-11606 Study of ATES thermal behavior using a steady flow model [DE81-030883] p0159 N82-12396 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization p0073 N82-12618 [DE81-029611] Department of Energy Solar Central Receiver Semiannual meeting [SAND-80-8049] p0074 N82-12632 Geothermal-resource verification for Air Force Bases Residual-energy-application program: EAST faculty remains facility requirements document, volume 1
[DE81-027536] p0142 p0142 N82-13526 Industrial process heat applications for solar thermal technologies [DE81-025934] p0081 N82-15545 SERI Solar-Energy-Storage Program [DE81-029476] p0082 N82-15576 THERMAL EXPANSION Thermal deformation of concentrators in an antisymmetric temperature field p0062 A82-18698 THERMAL INSULATION An analytical comparison of the efficiency of solar thermal collector arrays with and without external manifolds [NASA-CR-161852] p0063 N82-Comparative thermal performance of direct gain, p0063 N82-10501 Trombe, and sunspace walls p0081 N82-15571 [DE81-030546] Transwall: A modular visually transmitting thermal storage wall [DE81-029821] p0160 N82-15579 THERMAL MAPPING
Heat flow studies and geothermal exploration in
western Trans-Pecos Texas p0110 N82-12684 Geologic applications of thermal-inertia mapping from satellite --- Powder River, Wyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [282-10011] p0118 N82-154 p0118 N82-15489

Pyrolytic characterization of the organic matter

in selected coals and in the Devonian shales of

THER MAL NOISE SUBJECT INDEX

THERMAL BOISE	On the efficiency of thermal engines with power
Thermoelectric conversions based on noise	output - Harmonically driven engines
rectification p0138 N82-10936	p0131 A82-14489 Economic assessment of advanced central-receiver
THERMAL RADIATION	solar-thermal power systems: Executive summary
A spacecraft thermophotovcltaic power source with	[DOE/SF-10601/0] p0074 N82-12624
thermal storage	THERMODYNAMIC EPPICIENCY
p0044 A82-11711	The economic implications of the exergy and
THERMAL BESISTABCE Sputter etched metal solar selective absorbing	thermal efficiencies of energy conversion systems p0121 A82-11702
surfaces for high temperature thermal collectors	Development free-piston Stirling test-bed engine
p0057 A82-16057	p0123 A82-11808
THER MAL RESOURCES	The GA sulfur-iodine water-splitting process - A
Industrial process heat applications for solar	status report . p0084 A82-11844
thermal technologies [DE81-025934] p0081 N82-15545	Aquifer thermal energy storage - A feasibility
THERMAL STABILITY	study for large scale demonstration
Solar selective properties and high temperature	p0 154 A82-11846
stability of CVD ZrB2	Effect of wick dryness on the performance of heat
p0057 182-16055 Mechanically stable hydride composites designed	pipes with separate channels p0005 A82-16272
for rapid cycling	End region and current consolidation effects upon
p0084 A82-16347	the performance of an MHD channel for the ETF
THERMAL STRESSES	conceptual design Engineering Test Facility
Relaxation of geothermal-reservoir stresses induced by heat production	[AIAA PAPER 82-0325] p0135 A82-17889 An analytical comparison of the efficiency of
[DE81-032024] p0105 N82-11715	solar thermal collector arrays with and without
Workshop proceedings: U-bend tube cracking in	external manifolds
steam generators	[NASA-CR-161852] p0063 N82-10501
[DE81-903765] p0142 M82-13515	Technological activities for high performance
Cool-down flow-rate limits imposed by thermal stresses in LNG pipelines	receivers for solar thermal power plants [BMFT-PB-T-80-133] p0066 N82-10571
[DE81-028731] p0150 N82-14484	Evaluation of the micro-carburetor
THER MALIZATION (ENERGY ABSORPTION)	[NASA-CR-164958] p0016 N82-11994
Cycle and performance analysis of absorption heat	Optimization of solar heating and cooling systems
pumps for waste heat utilization [DE81-030705] p0103 N82-11405	[NP-1903997] p0072 N82-12599 Seasonal performance factors for active solar
	systems and heat-pump systems
Chemical heat pump program: An overview [DE81-025086] p0012 N82-11414 THERRIOBIC CONVERTERS	[DE81-028569] p0074 N82-12625
	Improvement of thermal efficiency of flat plate
Thermionic combustor application to combined gas and steam turbine power plants	solar collectors [BMFT-FB-T-80-194]
p0124 A82-11818	End region and current consolidation effects upon
Characteristics of CVD silicon carbide thermionic	the performance of an MHD channel for the ETP
converters	conceptual design
p0124 A82-11821 High thermal power density heat transfer	[NASA-TM-82744] p0141 N82-12943 Evaluation of coal gasification/combined cycle
thermionic converters	power plant feasibility at the Sewells Point
[NASA-CASE-LEW-12950-1] p0139 N82-11399	Naval Complex, Norfolk, Virginia
Study of radiatively sustained cesium plasmas for	[AD-A103674] p0116 N82-14639
solar energy conversion	Organic fluids for the practical use in energy
[NASA-CR-166265] p0075 N82-13039 THERMIONIC POWER GENERATION	conversion systems of solar power plants [BMFT-FB-T-81-154] p0080 882-15537
High temperature cogeneration with thermionic	Project DEEP STEAM: Fourth meeting of the
burners	technical advisory panel
p0124 A82-11817	[DE81-029457] p0144 N82-15561
Thermionic application for future air force space power systems	THERMODYNAMIC PROPERTIES Thermodynamic basis for selecting heat storage
p0124 A82-11822	materials
The plasmadynamics and icnization kinetics of	p0153 A82-10019
thermionic energy conversion	Reduced heat flow - Mean heat flow relationship
p0137 N82-10494 THERMOCHEMICAL PROPERTIES	for the continental geothermal provinces p0089 A82-10372
Plutonium thermochemical solar cell	Thermophysical properties of coal liquids
p0043 A82-11215	[DE81-0279446] p0097 N82-10938
Use of oxide decompositions in advanced	Development of a thermodynamic properties
thermochemical hydrogen cycles for solar heat sources. Application of the tricobalt	correlation framework for the coal conversion industry, phase 1A
tetraoxide-cobalt monoxide pair	[DE81-030363] p0111 N82-12985
[DE81-030235] p0082' N82-15581	Transwall: A modular visually transmitting
THERMOCHEMISTRY	thermal storage wall
Materials science issues encountered during the development of thermconemical concepts in	[DE81-029821] p0160 882-15579 THERMODYNAMICS
screening of reactions for solar energy	Materials science issues encountered during the
applications	development of thermochemical concepts in
p0038 A82-10021	screening of reactions for solar energy
Mass spectrometric studies of MHD slag thermochemistry	, applications
[PB81-221434] p0138 N82-11173	p0038 A82-10021 Prospects for the development of solar energy in
Chemical heat pump program: An overview	the USSR Production of electric power by
[DE81-025086] p0012 N82-11414	thermodynamics methods
Thermochemical production of liquids from biomass	p0039 A82-10385
[DE81-030085] p0117 N82-15226 SERI Solar-Energy-Storage Program	Measured performance of falling-jet flash evaporators
[DE81-029476] p0082 N82-15576	[DE81-024355] p0161 N82-10565
THER HODYNAMIC CYCLES	Study of ATES thermal behavior using a steady flow
Regenerative pyroelectric heat engine	model ' notes #92_12306
p0126 A82-11833	[DE81-030883] p0159 N82-12396

SUBJECT INDEX TIMBER INVENTORY

Theoretical basis of the DOE-2 building energy use Development of an all-metal thick film cost effective metallization system for solar cells analysis program p0030 882-15242 [DE81,-028896] [NASA-CR-165043] p0078 N82-14630 Technology of controlled nuclear fusion [DE81-027361] THICKNESS p0144 N82-15893 The effect of rotor blade thickness and surface finish on the performance of a small axial flow THERMOSLECTRIC COOLING A thermoelectric refrigerator powered by turbine [NASA-TM-82726] photovoltaic solar collectors p0141 N82-13114 p0049 A82-11858 TRIB PILES THERMORLECTRIC GENERATORS Heterojunctions for thin film solar cells p0039 A82-10024
Thin cells - Their present status and future areas Regime characteristics of a solar thermoelectric generator and comparison of experimental and calculated data of development p0040 182-10390 p0046 A82-11764 Production of alloys of bismuth telluride for High efficiency thin-film Gals solar cells solar thermoelectric generators p0046 A82-11767 p0041 182-10471 Advances in photovoltaics R&D - An overview Combined solar-energy converters with selective p0047 A82-11793 *Thin foil cells - A challenge for space array coatings p0044 A82-11424 designers' A compact, efficient thermoelectric module for a p0049 A82-11842 Progress in large area photovoltaic devices based on amorphous silicon alloys space reactor p0122 A82-11749 Engineering development testing of the GPHS-RTG p0049 A82-11855 converter --- General Purpose Heat A numerical model of a graded band gap Source-Radioisotope Thermoelectric Generator for CdS/x/Te/1-x/ solar cell Galileo orbiter power supply p0050 A82-12817 Preparation and properties of graded band gap CdS/x/Te/1-x/ thin film solar cells p0122 A82-11752 Modular isotopic thermoelectric generator p0051 A82-12818 p0122 A82-11753 Nuclear electric power for space systems -Series resistance effects in 20 sq cm indium tin Technology background and flight systems program oxide-polycrystalline silicon solar cells p0051 A82-12819 p0123 A82-11756 Methods and problems of industrial-scale electric Thin-film gallium arsenide homojunction solar cells power generation from sclar energy p0052 A82-13200 A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition --- of Gals thin films p0050 182-12506 Thermoelectric conversions based on noise rectification p0138 N82-10936 p0053 A82-13803 Controls for solar heating and cooling Sputtered thin film electrodes for p0070 N82-11593 [DE81-025209] p0070 N82-119
Study of radiatively sustained cesium plasmas for photoelectrochemical cells p0055 A82-15111 solar energy conversion [NASA-CR-166265] Photoelectrochemical cells using polycrystalline and thin film MoS2 electrodes Environmental and radiological safety studies: Interaction of (238) Fu02 heat sources with terrestrial and aquatic environments Thin-film polycrystalline cadmium telluride solar cells and large-area polycrystalline silicon p0025 N82-13565 [DE81-032019] solar cells THERMOELECTRIC MATERIALS p0062 N82-10490 Production of alloys of bismuth telluride for Thin film photovoltaic devices solar thermoelectric generators p0063 N82-10491 p0041 182-10471 Material property data and their use in design and analysis for an elevated temperature solar code Investigation of photovoltaic mechanisms in polycrystalline thin-film solar cells [DE81-02/272] p0065: Controlled cadmium telluride thin films for p0065 N82-10539 p0055 A82-14847 solar-cell applications [DE81-023275] THERMOELECTRIC POWER GENERATION Advanced nigh temperature thermoelectrics for p0066 N82-10569 Amorphous boron-silicon-hydrogen alloys for space power p0125 A82-11823 thin-film heterojunction solar cells [DE81-027254] p Applications of thermoelectrics to geothermal p0068 N82-11558 Impurity effects in a-Si: H solar cells [DE81-025069] energy conversion p0069 N82-11575 p0125 A82-11824 Low-cost solar flat-plate-collector development Towards a high-temperature solar electric converter p0070 N82-11584 p0056 A82-15903 [DE81-025081] Thermoelectric conversions based on noise Photoelectrochemical solar cells: Stabilization of small-band-gap semiconductor in aqueous solution by surface-attached organic conducting rectification D0138 N82-10936 THER MOHY DRAULICS rolymer [DB81-030312] Effect of inhomogeneous flow distribution in a p0081 N82-15569 system of heat-generating solar collectors THROTTLING p0044 A82-11423 External fuel vaporization study [NASA-CR-165513] Geothermal systems: Principles and case histories p0114 N82-14371 TIDE POWERED GENERATORS --- Rook D0090 A82-12275 North American tidal power prospects A simplified model of the thermohydraulic p0131 A82-15667 behaviour of a linear collector network for the conversion of the solar energy International Symposium on Wave and Tidal Energy, 2nd, St. John's College, Cambridge, England, September 23-25, 1981, Proceedings p0062 A82-18816 Technology of controlled nuclear fusion [DE81-027361] p0 p0144 N82-15893 DO135 A82-18124 Ocean energy-waves, currents, and tides [DE81-025708] THERMONUCLEAR REACTIONS Uncertainties associated with inertial-fusion D0105 N82-11611 TIMBER INVENTORY ignition [DE81-025408] p0139 N82-11944 Wood resources and utilization patterns in the THICK PILMS North Central Region and energy needs for the manufacture of wood products Effects of processing parameters on thick film inks used for solar cell front metallization [DE81-030356] p0019 N82-12604 p0058 A82-16474

TIME SERIES ANALYSIS SUBJECT INDEX

TIME SERIES ANALYSIS	TRACE ELEMENTS
Wind speed simulation for economic evaluation of	Chemical element concentrations in liquids and
wind energy conversion systems [DE81-0300771 p0119 N82-15560	solids associated with power plants using PGD systems
[DE81-030077] p0119 N82-15560 TIB COMPOUNDS	[DE81-030422] p0027 N82-14322
Coal hydrogenation via bonding of metallic	Effects of coal fly-ash disposal on water quality
compounds to ccal, part 1. Solutilization of Illinois bituminous coal - the critical	in and around the Indiana Dunes National Lakeshore, Indiana
importance of methylene group cleavage, part 2	[PB81-238479] p0034 N82-15624
[DE81-027562] p0100 N82-11236	TRACKING (POSITION)
TIM OXIDES Series resistance effects in 20 sq cm indium tin	Simple tracking strategies for solar concentrations p0042 A82-11207
oxide-polycrystalline silicon solar cells	TRACKING STATIONS
p0051 A82-12819	An optimization model for energy generation and
n-/indium tin oxide//p-InF solar cells p0058 A82-16471	distribution in a dynamic facility p0011 N82-11310
Optimization of transparent electrode for solar	TRACTION
cells [DE81-023359] p0063 N82-10507	Design study of a continuously variable roller cone traction CVT for electric vehicles
[DE81-023359] p0063 N82-10507 TIP SPEED	[NASA-CR-159841] p0159 N82-12445
Methodology for the evaluation of aerodynamic	TRACTORS
performance and rotor optimization under constant RPMcperation	Energy consumption and heavy-duty vehicles tractor trucks
[AIAA PAPER 81-2560] p0128 A82-14019	p0008 N82-10573
TITANIUM ORIDES	TRAFFIC CONTROL
Sputtered thin film electrodes for photoelectrochemical cells	Measures of effectiveness of transportation systems management
p0055 A82-15111	[PB81-233884] p0026 N82-13984
TOKAHAK DEVICES	TRAINING ANALYSIS
<pre>RF-driven Tokamak reactor with sub-ignited, thermally stable operation</pre>	Education and training implications of biomass energy system use
[DE81-029437] p0139 N82-11935	[DE81-029956] p0028 N82-14664
TOLERANCES (MECHANICS)	TRAJECTORY OPTIMIZATION Fuel efficient flight profiles in an ATC flow
System of tolerances for a solar-tower power station p0053 A82-13717	management environment
TOLUENE	p0002 A82-13078
Supercritical multicomponent solvent coal extraction [NASA-CASE-NPO-15767-1] p0107 N82-12241	TRANSPER OF TRAINING Solar energy training program for code enforcement
Measurement of thermal conductivities in coal fluids	personnel
[DB82-000523] p0109 N82-12400	[DE81-030053] p0081 N82-15563
TOPOGRAPHY Geologic considerations in underground coal mining	TRANSPER ORBITS Comparative analyses of space-to-space central
system design	power stations [NASA-TP-1955] p0150 N82-14202
[NASA-CR-164961] p0104 N82-11516 TORNADORS	[NASA-TP-1955] p0150 N82-14202 TRANSIENT RESPONSE
A numerical model for the flow within the tower of	Load-change testing of a large commercial oxygen
a tornado-type wind energy system	plant [EPR1-NP-1824] p0096 N82-10275
TOROIDAL PLASMAS p0 131 A82-14844	Transient catalytic combustor model
The tilting mode in field-reversed configurations	[NASA-CR-165324] p0142 N82-13507
stabilıty of toroidal plasma eguılibrıa p0121 A82-11131	TRANSISTOR AMPLIFIERS Solid-state retrodirective phased array concepts
TORQUE	for microwave power transmission from Solar
Analytical solution of a simulation model for wind	Power Satellite p0149 N82-12568
turbines p0132 A82-16600	TRANSITION PLOW
TOTAL ENERGY SYSTEMS	Plow in geothermal wells. Part 4: Transition
Develop and test fuel cell powered on-site integrated total energy system. Phase 3:	criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366
Full-scale power plant development	TRANSITION METALS
[NASA-CR165328] p0142 N82-13490	Desulfurization with transition metal catalysts
TOWERS A central tower solar test facility /RM/CTSTF/	[DE81-028935] p0092 N82-10143 TRANSMISSION EFFICIENCY
p0048 A82-11797	Efficiency of Fresnel lenses
Gas cooled solar power plant for generating	p0043 A82-11387 Solar power satellite microwave power transmission
electrical energy in the 20MWe operating range (GAST): Preliminary design phase	and reception system
[BMFT-FB-T-81-097] p0080 N82-15530	p0145 A82-11743
TOXIC HAZARDS Outgassing of two synthetic fuels	Considerations for high accuracy radiation efficiency measurements for the Solar Power
[AD-A104580] p0100 N82-11231	Satellite (SPS) subarrays
Low-Btu-gasifier emissions toxicology	p0148 N82-12559 TRANSMISSION LOSS
[DE81-031000] p0014 N82-11651 Development of testing procedures and	Improved technique to measure electronically AC
bibliographic information relevant to the	losses in superconducting cables
testing of solid wastes resulting from synthetic	[DE81-029323] p0150 N82-15338 TRANSMISSIONS (MACHINE ELEMENTS)
fuels production [DE81-030822] p0020 N82-12661	Design study of a continuously variable roller
Environmental hazard rankings of pollutants	cone traction CVT for electric vehicles
generated in coal gasification processes [PB81-231698] p0026 N82-13576	[NASA-CR-159841] p0159 N82-12445 TRANSMITTER RECRIVERS
TOXICITY	Design and breadboard evaluation of the SPS
Identification and toxicity of	reference phase control system concept p0072 #82-12545
fractionated-shale-oil components [DE81-028460] p0021 N82-12766	TRABSBITTERS
	Coherent multiple tone technique for ground based
	SPS phase control p0147 N82-12546

Characteristics and trends of energy consumption	two-bladed wind turbines with passive cyclic
in transport missions with aircraft and surface	pitch variation
vehicles	[AIAA PAPER 81-2570] p0129 A82-14027
p0001 A82-10495 Puel for future transport aircraft	An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] p0129 A82-14029
[ASME PAPER 81-HT-80] p0089 A82-10965	Computational analysis of diffuser-augmented wind
Wing design for light transport alreraft with	turbines
improved fuel economy p0004 A82-14416	p0132 A82-16743
Liquid hydrogen - An outstanding alternate fuel	Enertech High Reliability prototype vibration analysis
for transport aircraft	p0133 A82-17635
p0085 A82-17290	First results from the UMass wind tunnel test
TRANSPORT PROPERTIES Bounds and exact theories for the transport	progrum for windpowered generator optimization p0134 A82-17643
properties of inhomogeneous media	Performance of a small low speed Darrieus type rotor
p0056 182-15607	p0136 A82-18328
Transport characteristics of alternate slurry fuels	An indoor blade test facility for determining the
[DE81-028580] p0146 N82-11255 TRANSPORTATION	basic aerodynamic properties of Darrieus wind turbine airfoils with test results for an NACA
Barriers to the utilization of synthetic fuels for	0015 and a modified section
transportation	p0136 N82-10005
[NASA-CR-165517] p0023 N82-13243 Measures of effectiveness cf transportation	Residual stresses in darrieus vertical axis wind turbine blades
systems management	[DE81-1026144] p0136 N82-10434
[PB81-233884] p0026 N82-13984	The effect of rotor blade thickness and surface
TRANSPORTATION ENERGY	finish on the performance of a small axial flow
Lightweight hydrides for automotive storage of hydrogen	turbine [NASA-TM-82726] p0141 N82-13114
p0084 A82-11790	Update on Specified European R and D Efforts.
Energy conservation through utilization of	Part 1: Appendices
mechanical energy storage	[DE81-026404] p0143 N82-13983
p0002 182-11845 An energy saving transit concept for new towns	TURBINE PUMPS Design considerations for a 1500 M head 300-600 MW
p0005 A82-15665	double stage reversible pump/turbine with
Alternative transportation vehicles for	regulation
military-base operations p0005 A82-16348	p0154 A82-11782 Preliminary design study of underground pumped
Technological innovation for success - Liquid	hydro and compressed-air energy storage in hard
hydrogen propulsion	rock. Volume 1: Executive summary
p0084 A82-16734	[DE81-029440] p0155 N82-10527
Pundamental investigations on fuel cells for transportation applications	Preliminary design study of underground pumped hydro and compressed-air energy storage in hard
р0137 ж82-10493	rock. Volume 2: Project design criteria: UPH
Mechanical energy storage technology project	[DE81-028107] p0156 N82-10528
[DE81-029753] p0155 N82-10508 Measures of effectiveness cf transportation	Preliminary design study of underground pumped hydro and compressed-air energy storage in hard
systems management	rock. Volume 12: Plant design, CAES
[PB81-233884] p0026 N82-13984	[DE81-028110] p0157 N82-10574
TREES (MATHEMATICS) Value tree analysis of energy supply alternatives	Innovative equipment for small-scale hydro developments
[AD-A105629] p0029 N82-14875	[DE81-027820] p0141 N82-12634
TRINIDAD AND TOBAGO	TURBIBES
Venezuela, Trinidad aud Tobago: Crude oil potential frcm kno⊌n deposits	Present status of Plorida Power Corporation's D.O.E. funded feasibility study of the Higgins
[DE81-027023] p0096 N82-10474	plant repowering/coal gasification project
TRITIUM	p0089 A82-11834
Hydrogen storage-bed design for tritium systems test assembly	Variable speed wind turbine control system p0127 A82-11859
[DB81-025336] p0086 N82-11262	Lightning protection for wind turbine electronics
TROMBE WALLS	[AIAA PAPER 81-2571] p0129 A82-14028
Comparative economic performance of selected	A numerical model for the flow within the tower of
passive solar heating and cooling technologies [DE81-030220] p0072 N82-12600	a tornado-type wind energy system p0131 A82-14844
Transwall: A modular visually transmitting	Analytical solution of a simulation model for wind
thermal storage wall	turbines
[DE81-029821] p0160 N82-15579 TROUGHS	p0132 A82-16600
Frequency response analysis of fluid control	American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980,
systems for parabolic-trough solar collectors	Proceedings
[DE81-029293] p0064 N82-10513	p0132 A82-17626
TRUCKS Energy consumption and heavy-duty vehicles	Energy potential and early operational experience for large wind turbines
tractor trucks	p0132 A82-17627
p0008 N82-10573	Alcoa vertical axis wind turbines
TUBE HEAT EXCHANGERS Dish stirling solar receiver combustor test program	p0133 A82-17628 Characteristics of vertical wind profiles at
[NASA-CR-165017] p0076 N82-13495	windpowered turbine sites
Development of a modular heat exchanger with	p0091 A82-17632
integrated latent heat energy store for solar heating applications	Operations of small wind turbines on a
[BMFT-FB-T-81-050] p0160 N82-15584	distribution system p0133 A82-17633
TURBINE BLADES	Evaluation of wind turbine generator operational
A vertical axis cyclogiro type wind-turbine with freely-hinged blades	hysteresis using 'Method of Bins' p0133 A82-17636
p0125 A82-11829	Yaw dynamics of a horizontal axis wind turbine
•	p0133 A82-17637

Experiences with a Grumman windstream	25	UNDERGROUND STORAGE	
horizontal axis wind turbine	p0134 A82-17638	Planning an underground pumped hydro the Commonwealth Edison Company	project for
Wind ripple analysis	p0154 202 11050		p0154 A82-11847
	p0138 N82-11044	Preliminary design study of undergrou	ind pumped
TURBOCOMPRESSORS		hydro and compressed-air energy sto	
The effect of rotor blade thickness and		rock. Volume 1: Executive summary	
finish on the performance of a small turbine	T SXIST LIOA	[DE81-029440] Preliminary design study of undergrou	p0155 N82-10527
	p0141 N82-13114	hydro and compressed-air energy sto	
TURBOGENERATORS	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	rock. Volume 2: Project design cr	
Dynamic performance analysis for the	solar hybrid		p0156 N82-10528
repowering of the El Paso Electric		Preliminary design study of undergrou	
Newman Unit No. 1		hydro and compressed-air energy sto	rage in hard
	P0048 A82-11802	rock. Volume 5: Site selection [DE81-028199]	-0156 NO2-10520
Turboexpanders for OTEC power plants [AIAA PAPER 81-2592]	p0003 A82-14040	Preliminary design study of undergrou	p0156 N82-10529
Turbines in the ocean	P0003 E02 14040	hydro and compressed-air energy sto	
	D0132 A82-16844	rock. Volume 9: Design approaches	
The generation of current from hydrog	en.	Appendix D: Mechanical systems	•
	P0085 A82-17131		p0156 N82-10530
Application of large and small wind to	arbine	Preliminary design study of undergrou	
generators - A utility rerspective	p0133 A82-17629	hydro and compressed-air energy sto rock. Volume 3: Project design cr	
Large wind turbine generator performa			p0156 N82-10546
assessment, technology status report		Preliminary design study of undergrou	
[DE81-903763]	p0137 N82-10524	hydro and compressed-air energy sto	rage in hard
Preliminary design study of undergroup		rock. Volume 12: Plant design, CA	
hydro and compressed-air energy sto			p0157 N82-10574
rock. Volume 1: Executive summary	p0155 N82-10527	Preliminary design study of undergrou hydro and compressed-air energy sto	
[DE81-029440] Preliminary design study of undergrou		rock. Volume 8: Design approaches	
hydro and compressed-air energy stor		[DE81-030673]	p0158 N82-11620
rock. Volume 2: Project design cr.		Preliminary design study of undergrou	
	p0156 N82-10528	hydro and compressed-air energy sto	
Fabrication, testing, and modeling plants		rock. Volume 9: Design approaches	
125-kW counter-rotating-turbine wave converter	e energy	appendix C. Major mechanical equip	p0158 N82-11621
	0137 H82-10559	Low-level radioactive waste: An intr	
Preliminary design study of undergroup		Overview	
hydro and compressed-air energy stor			p0022 N82-12924
rock. Volume 12: Plant design, CA		Mathematical modelling of some chemic	
	p0157 N82-10574	physical processes in underground c	oal
Lewis Research Center's coal-fired, p. fluidized-bed reactor test facility		gasification [DE81-027941]	p0116 N82-14613
	p0103 N82-11397	Comparison of potential radiological	
Vertical-axis wind-turbine control st		from a spent-fuel repository versus	
[DE81-031932]	p0141 N82-12591	natural-uranium deposits	
Aluminum blade development for the Mod	3-0A		p0029'N82-14910
200-kilowatt wind turbine [NASA-TM-82594]	p0143 N82-14633	Reservoir stability studies [DE81-030099]	p0160 N82-15510
TURBONACHINE BLADES	p0,43 B02 14033	Compressed-air energy-storage technol	
Calculation of natural modes of vibra	tion for	Overview	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
rotor blades by the finite element			p0160 N82-15548
	p0136 N82-10452	UNDERGROUND STRUCTURES	
TURBONACHINERY	turbino sustan	Planning an underground pumped hydro the Commonwealth Edison Company	project for
A modular simulation model for a wind [AIAA PAPER 81-2558]	c0128 A82-14017		p0154 A82-11847
Aerodynamic loads and rotor performan		Earth shelter 2. 1979-1980 USC serie	
Darrieus wind turbines			p0006 N82-10277
	P0130 A82-14034	Solar project description for Colorad	o Sunworks:
Preliminary design study of undergrou		Single family	-00(# NO2 40E40
hydro and compressed-air energy store rock. Volume 9: Design approaches		[DE81-028054] Sowiet UCG experience specifically re	p0064 N82-10510
appendix C. Major mechanical equip		field experiments in the United Sta	
	p0158 N82-11621		p0111 N82-13244
TURBULENT PLON	_	Sixth Underground Coal-Conversion Sym	
Plow aerodynamics modeling of an MHD			p0114 N82-14374
combustor - Calculations and experi- verification	mental	UNITED STATES OF AMERICA Electric power supply and demand for	+ho
	p0127 A82-12113	contiguous United States, 1981 - 19	
TWO DIMENSIONAL PLOW			p0012 #82-11376
A two-dimensional study of the maximum		UNIVERSITIES	
can be obtained from a wind turbine	in a wind	Seminars for private college administ	
shear layer [FPA-134]	DO140 N82-12537	solar applications for college buil	
TWO PHASE PLON	PA1-10 MAE 12721	UPPER ATHOSPHERE	p0079 N82-14661
Plow in geothermal wells. Part 4: 1	ransition	The stability of a tethered gyromill	
criteria for two-phase flow pattern	s	[AIAA PAPER 81-2569]	p0 129 ,A82-14026
	p0096 N82-10366	URANIUM	
Two-phase flow in geothermal energy se		Environmental readiness document. Ad Isotope Separation Program	vanced
[DE81-029037]	p0103 N82-11404		p0029 N82-14900
11		Comparison of potential radiological	consequences
U		from a spent-fuel repository versus	
UNDERGROUND EXPLOSIONS		natural-uranium deposits	0000 400 400
Suppression of coal dust explosion by barrier in a conveyor belt entry	water	[DE81-028232]	p0029 N82-14910
	p0024 N82-13489		

SUBJECT INDEX VEHILLATION

URANIUM COMPOUNDS	Intermediate photovoltaic-system application
Hydrogen storage-bed design for tritium systems	experiment operational performance report.
test assembly	Volume 1: For Lovington Square Shopping Center
[DE81-025336] p0086 N82-11262 URBAN PLANNING	site, Lovington, New Mexico [DE81-028971] p0065 N82-10543
The electric utility 4.5 MW fuel cell power plant	Project demonstration of wind-turbine electricity:
- An urban demonstration	Interconnecting a northern Michigan fruit farm
p0131 A82-15070	with a major utility
An energy saving transit concept for new towns	[DE81-030950] p0138 882-11380
p0005 A82-15665	Passive solar technical planning study
Modeling energy-conservation potentials of	[EPRI-EM-1591] p0072 N82-12578
community energy-system technologies	Analysis of potential cogeneration impacts on
[DE81-026059] p0013 N82-11589 URBAN RESEARCH	electricity generation by the Central Maine Power Company
Evaporative hydrocarbon emissions from a large	[DE81-029991] p0028 N82-14650
vehicle population	(0201 02010)
p0004 A82-14442	V
Urban ecosystem and resource-conserving urbanism	▼
in Third World cities	VACUUM DEPOSITION
[DB81-029854] p0016 N82-11995	Solution grown PbS/CdS multilayer stacks as
Evaluation of landfill gas as an energy source	selective absorbers p0041 A82-10472
feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584	Preparation and properties of graded band gap
URBAN TRANSPORTATION	CaS/x/Te/1-x/ thin film solar cells
An energy saving transit concept for new towns	p0051 A82-12818
p0005 A82-15665	VALUE ENGINERRING
USER MANUALS (COMPUTER PROGRAMS)	Value tree analysis of energy supply alternatives
Programmer's manual for the DOEHPE (DOE Heat Pump	[AD-A105629] p0029 N82-14875
Efficiency) program	VANADIUM OXIDES
[DB81-769452] p0007 N82-10551	V205-Si photovoltaic cells
User's guide to HELIOS: A computer program for	p0051 A82-12824 Rechargeable lithium/vanadium oxide cells
modeling the optical behavior of reflecting solar concentrators. Part 1: Introduction and	utilizing 2Me-THF/L1AsF6
code input	p0154 A82-15726
[DB81-031920] p0073 N82-12616	VAPOR DEPOSITION
USER REQUIREMENTS	Characteristics of CVD silicon carbide thermionic
Conceptual design for a multi-user medium BTU coal	converters
gasification complex. Volume 1: Executive	p0 124 A82-11821
Summary	A new low temperature III-V multilayer growth
[DE81-027139] p0101 N82-11238 User needs for solar decision-making tools: The	technique - Vacuum metalorganic chemical vapor deposition of GaAs thin films
homebullding industry	p0053 A82-13803
[DE81-027293] p0067 N82-11325	Investigations on a Se-CdO photovoltaic cell
Offshore petroleum industry environmental data	p0132 A82-16052
requirements: Emphasis on remote sensing	Solar selective properties and high temperature
p0027 N82-14557	stability of CVD 2rB2
UTAH	p0057 A82-16055
Meteorological and climatclogical investigation: Review of January - June 1980 investigative period	Controlled-flash pyrolysis
[DE81-030740] p0111 N82-12731	[DE82-000284] p0111 N82-13196
UTILITIES	Transient catalytic combustor model
Status report on Central Haine Power Company's DOR	[NASA-CR-165324] p0 142 N82-13507
Punded feasibility study of the Sears Island	VAPORIZING
integrated gasification combined cycle power plant	Vaporization and chemical transport under coal
p0089 A82-1,1835 Planning an underground pumped hydro project for	gasification conditions [PB81-245839] p0117 N82-15165
the Commonwealth Edison Company	VAPORS PO 117 R62-15105
p0154 A82-11847	Three-dimensional, finite elemental model for
Control of new energy sources in an electric	simulating heavier-than-air gaseous releases
utility system	over variable terrain
p0154 A82-13082	[DE81-C28689] p0032 N82-15602
Analysis of electric utility investments into wind power	VARIABILITY Effects of atmospheric variability on energy
[AIAA PAPER 81-2537] p0003 A82-14006	utilization and conservation
Utility operating strategy and requirements for	[DE81-026308] p0008 N82-10592
the wind power forecast	VARIABLE PITCH .PROPELLERS
[AIAA PAPER 81-2539] p0127 A82-14007	Yawing of wind turbines with blade cyclic pitch
Implementation of a siting methodology for utility	variation .
size WECS in western Massachusetts and northwestern Connecticut	[DE81-030091] p0138 N82-11045
[AIAA PAPER 81-2540] p0091 A82-14008	VEGETATION Development of peatlands in northern Minnesota
Solar thermal cost quals - Implementing a	[DE82-000873] p0112 N82-13475
methodology for assessing break-even value and	VELOCITY DISTRIBUTION
market potential	A two-dimensional study of the maximum power that
[AIAA PAPER 81-2550] p0054 A82-14013	can be obtained from a wind turbine in a wind
Incorporation and impact of a wind energy	shear layer
conversion system in generation expansion planning p0004 A82-15068	[FFA-134] p0140 M82-12537 VELOCITY MEASUREMENT
Potential dynamic impacts of wind turbines on	Controlled velocity testing of small wind energy
utility systems	conversion systems - An evaluation of a technique
p0131 A82-15071	p0134 A82-17642
Wind energy and the Mation's rural electric systems	VENEZUBLA
p0091 A82-17645	Venezuela, Trinidad and Tobago: Crude oil
Electric utility modeling extensions to evaluate	potential from known deposits
solar plants p0061 A82-18025	[DE81-027023] p0096 N82-10474 VENTILATION
Integration of decentralized generators with the	Indoor air quality
electric power grid [DE81-029731] p0006 N82-10334	[DE81-029857] p0033 N82-15611

VERTICAL DISTRIBUTION SUBJECT INDEX

VERTICAL DISTRIBUTION	n-/indium tin oxide//p-InP solar cells
Characteristics of vertical wind profiles at	p0058 A82-16471
windpowered turbine sites	Effects of double-exponential current-voltage
p0091 A82-17632	characteristics on the performance of solar cells
German-Argentine experiment: Vertical-rotor wind	p0058 A82-16472
engine p0141 #82-12648	A comparison of p-i-n and Schottky barrier hydrogenated amorphous silicon, a-Si:H, solar
VERTICAL ORIENTATION	cells
Residual stresses in darrieus vertical axis wind	p0060 A82-17649
turbine blades	The El Paso electric 20-kilowatt photovoltaic system
[DE81-1026144] p0136 N82-10434	[AIAA PAPER 82-0064] p0060 A82-17761
VIBRATION	End region and current consolidation effects upon
Dynamic stability of stacked disk type flywheels	the performance of an MHD channel for the ETF
[DE81-030008] p0156 N82-10535	conceptual design Engineering Test Pacility
VIBRATION MODE	[AILA PPPER 82-0325] p0135 A82-17889
Calculation of natural modes of vibration for	Electrical properties of infrared photovoltaic
rotor blades by the finite element method	Cd/x/Hg/1-x/Te detectors
[DFVLE-FB-81-07] p0136 N82-10452	p0136 A82-18466
VIBRATION TESTS	VOLTAGE AMPLIFIERS
Enertech High Reliability prototype vibration	Improved technique to measure electronically AC
analysis p0133 A82-17635	losses in superconducting cables [DE81-029323] p0150 N82-15338
VOLT-AMPERE CHARACTERISTICS	VOLTAGE REGULATORS
Numerical simulation of solar cell open circuit	Series vs. shunt regulators for power control in
voltage decay	satellite power systems
p0041 A82-10658	p0045 A82-11738
The contoured-oxide monolithic series-array solar	Distributed photovoltaic systems: Utility
battery	interface issues and their present status
p0042 A82-11190	[NASA-CR-165019] p0076 N82-13492
Cascade photogenerators based on silicon and	VORTEX GENERATORS
germanium matrix photoconverters	A numerical model for the flow within the tower of
p0044 A82-11422	a tornado-type wind energy system
Solar panel current degradation factors p0045 A82-11759	P0131 A82-14844 VOYAGER 2 SPACECRAFT
The development of high efficiency cascade solar	Highlights of 1981 activities
cells - An overview	[NASA-NEWS-RELEASE-81-199] p0161 N82-15008
p0047 A82-11794	[CC1 - 10 - 2 CEEE 2 CEE 2 CE
Effect of annealing CdS on a sintered CdS/Cu2S	\A/
solar cell	W .
p0051 A82-12820	WAPERS
ZnO - p-InP heterojunction solar cells	Thin cells - Their present status and future areas
p0051 A82-12821	of development
Photoelectrochemical behaviour of CdS/NaI.3.3NH3	p0046 A82-11764
/liquid sodium iodide ammoniate/ junctions -	WALL PRESSURE
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasıfiers
/liguid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] P0104 N82-11474 WASHING
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations:
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] P0104 N82-11474 WASHING
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-Si photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-Si/aqueous electrolyte	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-Si photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-Si/aqueous electrolyte interface	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] P0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-Si photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-Si/aqueous electrolyte interface p0052 A82-13199	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-Si photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-Si/aqueous electrolyte interface p0052 A82-13199 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1:
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-Si photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-Si/aqueous electrolyte interface p0052 A82-13199 Tain-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-Si photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-Si/aqueous electrolyte interface p0052 A82-13199 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISFOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-Si photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-Si/aqueous electrolyte interface p0052 A82-13199 Tain-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors French thesis	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 K82-12924 Technology assessment of solar energy systems:
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] Technology assessment of solar energy systems: Availability and impacts of woody biomass
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB61-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 Technology assessment of solar energy systems: Availability and impacts of woody blomass utilization in the Pacific Northwest
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-Si photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-Si/aqueous electrolyte interface p0052 A82-13199 Tain-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors French thesis p0055 A82-15006 Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0055 A82-15112 An analytical model for high-low-emitter /HLE/	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] Sulfur pollution control. Phase 1: The disposal program [PB81-222612] Dow-level radioactive waste: An introductory overview [DE81-026334] Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-S1 photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-S1/aqueous electrolyte interface p0052 A82-13199 Tain-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0055 A82-15112 An analytical model for high-low-emitter /BLE/ solar cells in concentrated sunlight	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] P0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] Sulfur pollution control. Phase 1: The disposal program [PB81-222612] Low-level radioactive waste: An introductory overview [DE81-026334] Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] Chemical element concentrations in liquids and
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-Si photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-Si/aqueous electrolyte interface p0052 A82-13199 Tain-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors French thesis p0055 A82-15006 Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0055 A82-15112 An analytical model for high-low-emitter /HLE/	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] Sulfur pollution control. Phase 1: The disposal program [PB81-222612] Dow-level radioactive waste: An introductory overview [DE81-026334] Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Chemical element concentrations in liquids and solids associated with power plants using FGD
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [D882-000705] Chemical element concentrations in liquids and solids associated with power plants using FGD systems [D881-030422] p0027 N82-14322 Coal conversion solid waste disposal
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Chemical element concentrations in liquids and solids associated with power plants using FGD systems [DE81-030422] Coal conversion solid waste disposal [DE81-028567] p0027 N82-14322
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB61-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 Technology assessment of solar energy systems: Availability and impacts of woody blomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Chemical element concentrations in liquids and solids associated with power plants using FGD systems [DE81-030422] p0027 N82-14322 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-S1 photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-S1/aqueous electrolyte interface p0052 A82-13199 Tain-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0055 A82-15112 An analytical model for high-low-emitter /HLE/ solar cells in concentrated sunlight p0055 A82-15441 Effect of junction depth on the performance of a diffused n/+/p silicon sclar cell p0056 A82-15444 Grain size dependence of the photovoltaic properties of solar grade polysilicon p0057 A82-16051	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] P0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] Sulfur pollution control. Phase 1: The disposal program [PB81-222612] Low-level radioactive waste: An introductory overview [DE81-026334] Technology assessment of solar energy systems: Availability and impacts of woody blomass utilization in the Pacific Northwest [DE82-000705] Chemical element concentrations in liquids and solids associated with power plants using FGD systems: [DE81-030422] Coal conversion solid waste disposal [DE81-028567] WASTE ENERGY UTILIZATIOH The economic implications of the exergy and
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Chemical element concentrations in liquids and solids associated with power plants using FGD systems [DE81-030422] p0027 N82-14322 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 WASTE EMERGY UTILIZATION The economic implications of the exergy and thermal efficiencies of energy conversion systems
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-S1 photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-S1/aqueous electrolyte interface p0052 A82-13199 Tain-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Current-voltage characteristics of semiconductor-electriclyte junction solar cells p0055 A82-15112 An analytical model for high-low-emitter /HLE/ solar cells in concentrated sunlight Effect of junction depth on the performance of a diffused n/+/p silicon sclar cell Grain size dependence of the photovoltaic properties of solar grade polysilicon p0057 A82-15444 Grain size dependence of the photovoltaic properties of solar grade polysilicon p0057 A82-16051 High efficiency inversion layer solar cells on polycrystalline silicon by the application of	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] P0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] Sulfur pollution control. Phase 1: The disposal program [PB81-222612] Low-level radioactive waste: An introductory overview [DE81-026334] Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] Chemical element concentrations in liquids and solids associated with power plants using FGD systems [DE81-030422] Coal conversion solid waste disposal [DE81-028567] WASTE ENERGY UTILIZATION The economic implications of the exergy and thermal efficiencies of energy conversion systems
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-S1 photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-S1/aqueous electrolyte interface p0052 A82-13199 Tain-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0055 A82-15112 An analytical model for high-low-emitter /HLE/ solar cells in concentrated sunlight p0055 A82-15441 Effect of junction depth on the performance of a diffused n/+/p silicon solar cell p0056 A82-15444 Grain size dependence of the photovoltaic properties of solar grade polysilicon p0057 A82-16051 High efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 K82-12924 Technology assessment of solar energy systems: Availability and impacts of woody blomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Chemical element concentrations in liquids and solids associated with power plants using FGD systems [DE81-030422] p0027 N82-14322 Coal conversion solid waste disposal [DE81-030422] p0027 N82-14680 WASTE RNERGY UTILIZATION The economic implications of the exergy and thermal efficiencies of energy conversion systems D0121 N82-11702 High temperature cogeneration with thermionic
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 N82-12924 Technology assessment of solar energy systems: Availability and impacts of woody blomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Chemical element concentrations in liquids and solids associated with power plants using FGD systems [DE81-028567] p0027 N82-14322 Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 WASTE ENERGY UTILIZATION The economic implications of the exergy and thermal efficiencies of energy conversion systems p0121 A82-11702 High temperature cogeneration with thermionic burners
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-S1 photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-S1/aqueous electrolyte interface p0052 A82-13199 Tain-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0055 A82-15112 An analytical model for high-low-emitter /HLE/ solar cells in concentrated sunlight p0055 A82-15441 Effect of junction depth on the performance of a diffused n/+/p silicon solar cell p0056 A82-15444 Grain size dependence of the photovoltaic properties of solar grade polysilicon p0057 A82-16051 High efficiency inversion layer solar cells on polycrystalline silicon by the application of silicon nitride	WALL PRESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] p0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [PB81-240319] p0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] p0008 N82-10585 Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 Sulfur pollution control. Phase 1: The disposal program [PB81-222612] p0014 N82-11652 Low-level radioactive waste: An introductory overview [DE81-026334] p0022 K82-12924 Technology assessment of solar energy systems: Availability and impacts of woody blomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Chemical element concentrations in liquids and solids associated with power plants using FGD systems [DE81-030422] p0027 N82-14322 Coal conversion solid waste disposal [DE81-030422] p0027 N82-14680 WASTE RNERGY UTILIZATION The economic implications of the exergy and thermal efficiencies of energy conversion systems D0121 N82-11702 High temperature cogeneration with thermionic
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion p0051 A82-12822 A practical method of analysis of the current-voltage characteristics of solar cells p0051 A82-12823 V205-S1 photovoltaic cells p0051 A82-12824 Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 Oxide optimization at the p-S1/aqueous electrolyte interface p0052 A82-13199 Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716 Silicon and gallium arsenide photovoltaic cells - Models for the functioning, experimentation, and application to concentrating collectors Prench thesis p0055 A82-15006 Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0055 A82-15112 An analytical model for high-low-emitter /BLE/ solar cells in concentrated sunlight p0055 A82-15441 Effect of junction depth on the performance of a diffused n/+/p silicon solar cell p0056 A82-15444 Grain size dependence of the photovoltaic properties of solar grade polysilicon polycrystalline silicon by the application of silicon nitride p0058 A82-16127 A method for experimental assessment of the	NOVEL DERESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] P0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [P881-240319] P0031 N82-15514 WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [P881-215014] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] Sulfur pollution control. Phase 1: The disposal program [PB81-222612] Low-level radioactive waste: An introductory overview [DE81-026334] Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] Chemical element concentrations in liquids and solids associated with power plants using FGD systems [DE81-030422] Coal conversion solid waste disposal [DE61-028567] WASTE EMERGY UTILIZATION The economic implications of the exergy and thermal efficiencies of energy conversion systems P0121 A82-11702 High temperature cogeneration with thermionic burners
/liquid sodium iodide ammoniate/ junctions - Utilization in solar energy conversion	NOVEL DERESSURE Novel design of pressure vessels and thermal shields in coal gasifiers [DE81-025828] P0104 N82-11474 WASHING Coal resources and sulphur emission regulations: A summary of 8 eastern and midwestern states [P881-240319] WASTE DISPOSAL Environmental compliance program handbook [DE81-030226] Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [P881-215014] Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] Sulfur pollution control. Phase 1: The disposal program [P881-222612] Low-level radioactive waste: An introductory overview [DE81-026334] Technology assessment of solar energy systems: Availability and impacts of woody blomass utilization in the Pacific Northwest [DE82-000705] Chemical element concentrations in liquids and solids associated with power plants using FGD systems [DE81-030422] Coal conversion solid waste disposal [DE81-030422] P0027 N82-14322 Coal conversion solid waste disposal [DE81-028567] WASTE ENERGY UTILIZATION The economic implications of the exergy and thermal efficiencies of energy conversion systems P0121 A82-11702 High temperature cogeneration with thermionic burners P0124 A82-11817 Turboexpanders for OTEC power plants

Vertical combustor for refuse combustion	WASTE UTILIZATION
[DE81-030002] P0098 N82-11152 Feasibility and economic study of medium-BTU coal	Energy from biomass and wastes V: Proceedings of the Fifth Symposium, Lake Buena Vista, PL,
gas blended with high-BIU by product gas as an	January 26-30, 1981
industrial energy source at Billings, Montana	p0090 A82-12400
[DE81-025166] p0101 x82-11237	Methane production from alkaline food waste
Production and utilization of methane from	p0092 N82-10115
anaerobic sludge digestion in U.S.	Crystallized fly-ash feasibility study
wastewater-treatment plants	[EPRI-EL-1836] p0009 N82-10599
[DE81-029958] p0101 N82-11246	The severity of institutional barriers affecting
Cycle and performance analysis of absorption heat	energy-from-municipal-waste technologies
pumps for waste heat utilization	[DE82-000133] p0018 N82-12583
[DE81-030705] p0103 N82-11405	Energy recovery from municipal solid waste and
Fluid-bed heat-exchanger optimization and bed materials selection	sewage sludge using multi-solid fluidized bed
[DOE/ET-11343/T2] p0104 N82-11571	combustion technology [DE82-001142] p0110 N82-12596
Residual-energy-applications program:	Interactive model to assess economics of anaerobic
EAST-facility requirements document	digestion of the farm
[DE81-027489] p0014 N82-11616	[DE82-000452] p0110 N82-12620
Air circuit with heating pump	Treatment of biomass gasification wastewaters
[BMFT-FB-T-80-188] p0017 N82-12404	using reverse osmosis
High-temperature counter-flow recuperator	[DE82-000698] p0025 N82-13566
[DE81-031923] p0017 N82-12424	Treatment of blomass-gasification wastewaters by
Utilization of waste heat from major transformer	wet-air oxidation
substations. Volume 1: Generic study [DE81-904212] p0019 N82-12593	[DE82-000935] p0025 N82-13567
Utilization of waste heat from major transformer	Energy balance and utilization of agricultural waste on a farm
substations. Volume 2: Site-specific study	[PB81-229262] p0115 N82-14385
[DE81-904236] p0019 N82-12594	Energy recovery from municipal waste development
Design, construction, and operation of a full	program for Idaho Falls, Idaho
scale experimental anaerobic fermentation facility	[DE81-029999] p0028 N82-14659
[DE81-029028] p0110 N82-12605	Proceedings: Symposium on Flue Gas
Conversion of municipal sclid waste to energy,	Desulfurization, volume 2
Jacksonville, Florida, phase 1	[PB81-243164] p0035 N82-15652
[DE82-000808] p0019 N82-12613	WASTE WATER
Waste-to-energy Systems Institutional Barriers Assessment Workshop	Production and utilization of methane from
[DE82-000098] p0019 N82-12621	anaerobic sludge digestion in U.S. wastewater-treatment plants
Power-plant fly-ash utilization: A	[DE81-029958] p0101 N82-11246
chemical-processing perspective	Kinetics of wet oxidation of biological sludges
[DE81-025452] p0022 N82-13191	from coal-conversion wastewater treatment
Design and development of a reciprocating	[DE82-000525] p0021 N82-12674
low-temperature freon expander	WASTES
[DE81-028609] p0023 N82-13392	Survey of particulate emission macro- and
Residual-energy-applications program environmental	micro-sampling and sizing methods
Residual-energy-applications program environmental analysis report industrial scale waste heat	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST faculity requirements document, volume 1	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST faculity requirements document, volume 1	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST faculity requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - *81
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-S0L-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report.
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-S0L-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-PB-T-81-099] p0030 N82-15367	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report.
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] P0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMPT-FB-T-81-099] p0030 N82-15367 STE TREATMENT	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-S0L-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report. p0084 A82-11844 Thermochemical processes for hydrogen production
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] Naste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BHPT-FB-T-81-099] p0030 N82-15367 STE TREATMENT Energy from biomass and wastes V; Proceedings of the Fifth Symposium, Lake Buena Vista, PL, January 26-30, 1981	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report. p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMPT-PB-T-81-099] p0030 N82-15367 STE TREATMENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-S0L-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p083 A82-11785 Alkaline solution water electrolysis - '81 p0883 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - Prom theory to practice p0086 A82-18392 WATER CONSUMPTION water and energy usage in coal preparation
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BHFT-PB-T-81-099] p0030 N82-15367 STE TREATHENT Energy from biomass and wastes V; Proceedings of the Fifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392 WATER COBSUMPTION Water and energy usage in coal preparation [PB81-238248] p0112 N82-13486
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-PB-T-81-099] p0030 N82-15367 STE TREATHENT Energy from biomass and wastes V; Proceedings of the Fifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773]	micro-sampling and sizing methods [DE81-028348] p0014 N82-11642 WHTER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report. p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392 WATER COESUMPTION Water and energy usage in coal preparation [PB81-238248] WATER PLOW
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-FB-T-81-099] p0030 N82-15367 STE TERATMENT Energy from biomass and wastes V; Proceedings of the Fifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] Thermal processing of used catalysts	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report. p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392 WATER COMSUMPTION Water and energy usage in coal preparation [PB81-238248] p0112 N82-13486 WATER PLOW One-dimensional model of vapor-dominated
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-FB-T-81-099] p0030 N82-15367 STE TREATMENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility PGD (Flue Gas Desulfurization) survey [PB81-225773] Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-S0L-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392 WATER COESUMPTION Water and energy usage in coal preparation [PB81-238248] p0112 N82-13486 WATER FLOW One-dimensional model of vapor-dominated geothermal systems
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-FB-T-81-099] p0030 N82-15367 STE TREATHENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 EVALUATION of landfill gas as an energy source	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report. p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392 WATER COMSUMPTION Water and energy usage in coal preparation [PB81-238248] p0112 N82-13486 WATER FLOW One-dimensional model of vapor-dominated geothermal systems
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BHFT-FB-T-81-099] p0030 N82-15367 STE TREATHENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, PL, January 26-30, 1981 p0090 A82-12400 EPA utility PGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BHFT-FB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report. p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392 WATER COMSUMPTION Water and energy usage in coal preparation [PB81-238248] p0112 N82-13486 WATER FLOW One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Planning an underground pumped hydro project for
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-FB-T-81-099] p0030 N82-15367 STE TREATHENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 EVALUATION of landfill gas as an energy source	micro-sampling and sizing methods [DE81-028348] p0014 M82-11642 WATER The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report. p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392 WATER COMSUMPTION Water and energy usage in coal preparation [PB81-238248] p0112 N82-13486 WATER FLOW One-dimensional model of vapor-dominated geothermal systems
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-PB-T-81-099] p0030 N82-15367 STE TREATHENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility PGD (Plue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-PB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Waste-to-energy Systems Institutional Barriers Assessment Workshop	### Intercorrections of the General Electric solid polymer electrolyte water electrolysis technology —— hydrogen production by water splitting — From theory to practice p0084 A82-11844 Farance and energy usage in coal preparation p0089 A82-113486 FAFER PLOW One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Planning an underground water in p0089 A82-11033 Planning an underground water in p0089 A82-11033 Planning an underground polymens of the General Electric solid polymer electrolyte water electrolysis technology —— hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process — A status report. p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting — From theory to practice p0086 A82-18392 WATER COMSUMPTION water and energy usage in coal preparation [PB81-238248] p0112 N82-13486 WATER PLOW One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Planning an underground pumped hydro project for the Commonwealth Edison Company
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] Naste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-FB-T-81-099] p0030 N82-15367 STE TREATMENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, PL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source	### Interconsection of the General Electric solid polymer electrolyte water electrolysis technology ————————————————————————————————————
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMPT-PB-T-81-099] p0030 N82-15367 STE TREATMENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-PB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] p0019 N82-12621 Development of testing procedures and	### Interconservation Parametric study of the General Electric solid polymer electrolyte water electrolysis technology Parametric study of the General Electric solid polymer electrolyte water electrolysis technology Parametric study of the General Electric solid polymer electrolyte water electrolysis technology Parametric study of the General Electric solid polymer electrolyte water electrolysis technology Parametric study of the General Electric solid polymer electrolyte water electrolysis technology Parametric study of the General Electric solid polymer electrolyte water electrolysis technology Parametric study of the General Electric solid polymer electrolyte water electrolysis technology Parametric study Parametric study
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-FB-T-81-099] p0030 N82-15367 STE TREATMENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] p0019 N82-12621 Development of testing procedures and bibliographic information relevant to the	### Interconsection of the General Electric solid polymer electrolyte water electrolysis technology ————————————————————————————————————
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BHPT-FB-T-81-099] p0030 N82-15367 STE TREATHENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, PL, January 26-30, 1981 p0090 A82-12400 EPA utility PGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BHFT-FB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] p0019 N82-12621 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from	### Intercorrections of the General Electric solid polymer electrolyte water electrolysis technology ————————————————————————————————————
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-FB-T-81-099] p0030 N82-15367 STE TREATMENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] p0019 N82-12621 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic-fuels production	### Interconsection of the General Electric solid polymer electrolyte water electrolysis technology ————————————————————————————————————
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-FB-T-81-099] p0030 N82-15367 STE TREATMENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility PGD (Flue Gas Desulfurization) survey [PB81-225773] Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-00098] p0019 N82-12621 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic-fuels production [DE81-030671] p0021 N82-12673	### Interconservation of the General Electric solid polymer electrolyte water electrolysis technology —— hydrogen production by water splitting — Prom theory to practice pomes and energy usage in coal preparation [PB81-238248] ###################################
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-028016] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMFT-FB-T-81-099] p0030 N82-15367 STE TREATMENT Energy from biomass and wastes V; Proceedings of the Pifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 p0090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] p0110 N82-12584 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] p0019 N82-12621 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic-fuels production	### Interconsection of the General Electric solid polymer electrolyte water electrolysis technology ————————————————————————————————————
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-030887] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMPT-PB-T-81-099] p0030 N82-15367 STE TERATMENT Energy from biomass and wastes V: Proceedings of the Pifth Symposium, Lake Buena Vista, PL, January 26-30, 1981 p0090 A82-12400 EPA utility PGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-00016] p0110 N82-12584 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] p0019 N82-12621 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic-fuels production [DE81-030671] p0021 N82-12673 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566	### Intercorrections of the General Electric solid polymer electrolyte water electrolysis technology — hydrogen production by water splitting — From theory to practice p0084 A82-11844 The management and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis — '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology —— hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process — A status report. p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting — From theory to practice p0086 A82-18392 WATER COMSUMPTION Water and energy usage in coal preparation [PB81-238248] p0112 N82-13486 WATER FLOW One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Planning an underground pumped hydro project for the Commonwealth Edison Company p0154 A82-11847 Practure flow of groundwater in coal-bearing strata [DE81-023810] p0096 N82-10479 WATER HEATING Conceptual design of an advanced water/steam receiver for a solar thermal central power system [ASME PAPER 81-SOL-5] p0042 A82-10973 Thermal performance of a solar still p0058 A82-16229
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] Blomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] New and renewable energy in the United States of America [DE81-030887] Waste heat and chill storage in aquifer systems [DE81-028016] Rotating regenerative heat exchanger for energy recovery in chemical plants [BHTT-FB-T-81-099] STE TREATMENT Energy from biomass and wastes V: Proceedings of the Fifth Symposium, Lake Buena Vista, FL, January 26-30, 1981 PO090 A82-12400 EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] Thermal processing of used catalysts [BMFT-FB-T-80-189] Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-000116] Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic-fuels production [DE81-030671] Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] Treatment of blomass-gasification wastewaters by	### The development and design of steam/water solar receivers for commercial application [ASHE PAPER 81-SOL-4] p0042 A82-10972 Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production The GA sulfur-iodine water-splitting process - A status report. Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392 WATER CONSUMPTION Water and energy usage in coal preparation [PB81-238248] p0112 N82-13486 WATER PLOW One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Planning an underground pumped hydro project for the Commonwealth Edison Company Practure flow of groundwater in coal-bearing strata [DE81-023810] WATER HEATING Conceptual design of an advanced water/steam receiver for a solar thermal central power system [ASHE PAPER 81-SOL-5] p0042 A82-10973 Thermal performance of a solar still p0058 A82-16229 Wind driven fluid devices for water heating
Residual-energy-applications program environmental analysis report industrial scale waste heat recovery equipment and utilization [DE81-027538] p0024 N82-13525 Residual-energy-application program: EAST facility requirements document, volume 1 [DE81-027536] p0142 N82-13526 Biomass energy systems: Descriptions and employment requirements for typical operations [DE82-000236] p0113 N82-13538 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Waste heat and chill storage in aquifer systems [DE81-030887] p0159 N82-14652 Rotating regenerative heat exchanger for energy recovery in chemical plants [BMPT-PB-T-81-099] p0030 N82-15367 STE TERATMENT Energy from biomass and wastes V: Proceedings of the Pifth Symposium, Lake Buena Vista, PL, January 26-30, 1981 p0090 A82-12400 EPA utility PGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 Evaluation of landfill gas as an energy source feasibility of methane recovery from landfills [DE82-00016] p0110 N82-12584 Waste-to-energy Systems Institutional Barriers Assessment Workshop [DE82-000098] p0019 N82-12621 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic-fuels production [DE81-030671] p0021 N82-12673 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566	WATER CONSUMPTION Water and energy usage in coal preparation (PB81-238248] WATER The development and design of steam/water solar receivers for commercial application [ASHE PAPER 81-SOL-4] Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 Alkaline solution water electrolysis - '81 p0083 A82-11786 Development status of the General Electric solid polymer electrolyte water electrolysis technology hydrogen production p0083 A82-11787 The GA sulfur-iodine water-splitting process - A status report. p0084 A82-11844 Thermochemical processes for hydrogen production by water splitting - From theory to practice p0086 A82-18392 WATER CONSUMPTION Water and energy usage in coal preparation [PB81-238248] WATER FLOW One-dimensional model of vapor-dominated geothermal systems p0089 A82-11033 Planning an underground pumped hydro project for the Commonwealth Edison Company p0154 A82-11847 Practure flow of groundwater in coal-bearing strata [DE81-023810] WATER HEATING Conceptual design of an advanced water/steam receiver for a solar thermal central power system [ASNE PAPER 81-SOL-5] p0042 A82-10973 Thermal performance of a solar still p0058 A82-16229 Wind driven fluid devices for water heating p0134 A82-17639

Application of solar thermal energy to buildings and industry	Pabrication, testing, and modeling plans for a 125-kW counter-rotating-turbine wave energy
[SERI/TP-641-1222] p0066 N82-10563	converter
Preliminary investigation on a primary energy	[DE81-023946] p0137 H82-10559
saving heat supply system for the residential	Ocean energy-waves, currents, and tides
district "Maria lindenhof" in Dorsten, West Germany using river water as a heat source	[DE81-025708] p0105 N82-11611 Overview and FY 1981 progress on open-cycle OTEC
and systems engineering	power systems
[BMFT-FB-T-80-157] p0008 N82-10572	[DE81-029277] p0144 N82-15580
The Rogers focusing heliostat experimental program	WAVE PROPAGATION
at Rensselaer Polytechnic Institute [PB81-226813] p0071 N82-11625	Proposed experimental studies for assessing ionospheric perturbations on SPS uplink pilot
Solar Heating And Cooling Of Buildings (SHACOB):	beam signal
Requirements definition and impact analysis-2.	p0147 N82-12543
Volume 2: Domestic hot water systems	Ionospheric effects in active retrodirective array
[DE82-900207] p0071 M82-12279 Puel savings in hot water beating plants by	and mitigating system design p0147 N82-12551
application of heat rumps operated with natural	WAVEGUIDE ANTENNAS
gas (natural gas heat pump). Project: gas engine	SPS antenna element evaluation
[BMFT-FB-T-80-125] p0020 N82-12641	p0148 N82-12555
Appliance efficiency and the solar building [DE81-029073] p0075 M82-13265	Evaluation of thick wall wave guide element p0148 N82-12557
Moorhead district heating, phase 2	Method for precision forming of low-cost,
[DE81-029689] p0031 N82-15556	thin-walled slotted waveguide arrays for the SPS
WATER POLLUTION	p0148 N82-12558
Assessment of water supply contamination due to underground coal gasification	WEATHER Effects of atmospheric variability on energy
[PB81-209215] p0021 N82-12680	utilization and conservation
Effects of coal fly-ash disposal on water quality	[DE81-026308] p0008 N82-10592
in and around the Indiana Dunes National	PEATHER FORECASTING
Lakeshore, Indiana [PB81-238479] p0034 N82-15624	The Seasat commercial demonstration program p0115 N82-14561
WATER QUALITY	WEIGHT REDUCTION
Assessment of water supply contamination due to	High performance silicon solar arrays employing
underground coal gasification	advanced structures p0045 A82-11758
[PB81-209215] p0021 M82-12680 Effects of coal fly-ash disposal on water quality	Thin cells - Their present status and future areas
in and around the Indiana Dunes National	of development
Lakeshore, Indiana	p0046 A82-11764
[PB81-238479] p0034 N82-15624	Lightweight hydrides for automotive storage of
WATER RESOURCES Peasibility of a small scale pumped storage	hydrogen p0084 A82-11790
demonstration project, Hibbing, Minnesota	RELDING
-0455 -00 40505	Space nuclear safety and fuels program
[DB81-028678] p0155 N82-10525	
Coal liquefaction demonstration plant near	p0111 N82-12921
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment	p0111 N82-12921
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 M82-11269	p0111 N82-12921 WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near	p0111 N82-12921 WELLS Flow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment	p0111 N82-12921 WELLS Flow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DZ81-028312] Two-phase flow in geothermal energy sources
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] p0011 N82-11270	p0111 N82-12921 WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] Two-phase flow in geothermal energy sources [DE81-029037] Well-water-source heat pump field performance study
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 M82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] p0011 M82-11270 Synthetic fuel development for the Upper Missouri	p0111 N82-12921 WELLS Flow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 M82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] p0011 M82-11270 Synthetic fuel development for the Upper Missouri River Basin, Section 13: Water assessment report	p0111 N82-12921 WELLS Flow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] P0011 N82-11276	p0111 N82-12921 WELLS Flow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section	P0111 N82-12921 WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 M82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] p0011 M82-11270 Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] p0011 M82-11276 Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c)	Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect,
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] p0013 N82-11524	PO111 N82-12921 WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 M82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] p0011 M82-11270 Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] p0011 M82-11276 Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c)	Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect,
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] P0013 N82-11524 Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] P0013 N82-11525	P0111 N82-12921 WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-006529] Pield demonstration of the conventional steam drive process with ancillary materials
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-2161129] WATER VAPOR	P0111 N82-12921 WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p00 12 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] Two-phase flow in geothermal energy sources [DE81-029037] Well-water-source heat pump field performance study [DE81-024136] Designing process wells for an underground coal-gasification environment [DE81-028434] Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] Field demonstration of the conventional steam
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-2161129] WATER VAPOR	P0111 N82-12921 WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-006529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-2161129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p00 12 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] Two-phase flow in geothermal energy sources [DE81-029037] Well-water-source heat pump field performance study [DE81-024136] Designing process wells for an underground coal-gasification environment [DE81-028434] Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of point near
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-2161129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p00 12 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-2161129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 N82-11269
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] Two-phase flow in geothermal energy sources [DE81-029037] Well-water-source heat pump field performance study [DE81-024136] Designing process wells for an underground coal-gasification environment [DE81-028434] Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration plant near Horgantown, West Virginia; water assessment report section 13(b) [FB81-216095] FO0103 N82-11269 Coal liquefaction demonstration plant near
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Plow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817]	PO111 N82-12921 WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-006529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains qasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WAVES MOdular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATERPROOFING Suppression of coal dust explosion by water	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] Two-phase flow in geothermal energy sources [DE81-029037] Well-water-source heat pump field performance study [DE81-024136] Designing process wells for an underground coal-gasification environment [DE81-028434] Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] Field demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [FB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] P0011 N82-11270
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WAVES MOCEAN dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATERPROOFING Suppression of coal dust explosion by water barrier in a conveyor belt entry	PO111 N82-12921 WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-006529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 N82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] p0011 N82-11270 Pyrolytic characterization of the organic matter
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Plow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATERFROOFING Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] P0024 N82-13489	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-006529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 N82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] p0011 N82-11270 Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Plow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATERFROOFING Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] P0024 N82-13489	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 N82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report february (PB81-216103) p0103 N82-11270 Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of southern West Virginia
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Plow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATER PROOFING Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] WATERWAVE BUERGY CONVERSION WAVES OF energy	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-006529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 N82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: water assessment report [PB81-216103] p0011 N82-11270 Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of southern West Virginia
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Plow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATER WHEELS Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] WATERWAVE BUERGY COMVERSION WAVES of energy North American tidal power prospects	Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PE81-216095] p0103 N82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report fP881-216103] p0011 N82-11270 Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of southern West Virginia p0113 N82-13578 WHISKER COMPOSITES Electrodes and diaphragms for fuel cells
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Plow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATER PROOFING Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] WATER WAVES ENERGY COMVERSION WAVES OF energy North American tidal power prospects P0131 A82-10450	WELLS Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-02937] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PE81-216095] p0103 N82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PE81-216103] p0011 N82-11270 Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of southern West Virginia p0113 N82-13578 WHISKER COMPOSITES Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 E82-14666
Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Plow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATER WHEELS Suppression of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] WATERWAVE BUERGY COMVERSION WAVES of energy North American tidal power prospects	Plow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PE81-216095] p0103 N82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report fP881-216103] p0011 N82-11270 Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of southern West Virginia p0113 N82-13578 WHISKER COMPOSITES Electrodes and diaphragms for fuel cells
Coal liquefaction demonstration plant near Horgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATER PHEELS Modular hydro dam approach to the economic development of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] PO024 N82-13489 WATER WAVES ENERGY CONVERSION WAVES OF energy North American tidal power prospects International Symposium on Wave and Tidal Energy, 2nd, St. John's College, Cambridge, England, September 23-25, 1981, Froceedings	WELLS Flow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 N82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-21603] p0101 N82-11270 Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of southern West Virginia WHISKER COMPOSITES Electrodes and diaphragms for fuel cells [BMFT-PB-T-81-047] p0143 R82-14666 WICKS Effect of wick dryness on the performance of heat pipes with separate channels
Coal liquefaction demonstration plant near Horgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Horgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216112] FOUNDATION OF THE PROPERTY OF	WELLS Flow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] Two-phase flow in geothermal energy sources [DE81-029037] Well-water-source heat pump field performance study [DE81-024136] Designing process wells for an underground coal-gasification environment [DE81-028434] Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of southern West Virginia WHISKER COMPOSITES Electrodes and diaphragms for fuel cells [BMFT-PB-T-81-047] WICKS Effect of Wick dryness on the performance of heat pipes with separate channels
Coal liquefaction demonstration plant near Horgantown, West Virginia; water assessment report section 13(b) [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Synthetic fuel development for the Upper Missouri River Basin. Section 13: Water assessment report [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report section 13(c) [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] WATER VAPOR Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process [AIAA PAPEE 81-2596] WATER WAVES Ocean energy-waves, currents, and tides [DE81-025708] WATER WHEELS Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] WATER PHEELS Modular hydro dam approach to the economic development of coal dust explosion by water barrier in a conveyor belt entry [PB81-233306] PO024 N82-13489 WATER WAVES ENERGY CONVERSION WAVES OF energy North American tidal power prospects International Symposium on Wave and Tidal Energy, 2nd, St. John's College, Cambridge, England, September 23-25, 1981, Froceedings	WELLS Flow in geothermal wells. Part 4: Transition criteria for two-phase flow patterns [DE81-028312] p0096 N82-10366 Two-phase flow in geothermal energy sources [DE81-029037] p0103 N82-11404 Well-water-source heat pump field performance study [DE81-024136] p0012 N82-11419 Designing process wells for an underground coal-gasification environment [DE81-028434] p0108 N82-12264 Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N82-14522 Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p0115 N82-14523 WEST VIRGINIA Coal liquefaction demonstration plant near Morgantown, West Virginia; water assessment report section 13(b) [PB81-216095] p0103 N82-11269 Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-21603] p011 N82-11270 Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of southern West Virginia WHISKER COMPOSITES Electrodes and diaphragms for fuel cells [BMFT-PB-T-81-047] p0143 B82-14666 WICKS Effect of wick dryness on the performance of heat pipes with separate channels

WIED DIRECTION	A first order mathematical model of the lift/drag
Up- and down-wind rotor half interference model	characteristics of aerofoil sections
for VANT Vertical Axis Wind Turbines	p0130 A82-14357
[AIAA PAPER 81-2579] p0129 A82-14031 Wind energy for the Pederal Republic of Germany	An analytic model of high solidity vertical axis windmills
p0130 A82-14358	p0131 A82-14360
WIND EPPECTS	Potential dynamic impacts of wind turbines on utility systems
Wind ripple analysis [DE81-030129] p0138 M82-11044	p0131 A82-15071
WIND PROPILES	Wind-energy recovery by a static Scherbius
Characteristics of vertical wind profiles at windpowered turbine sites	induction generator p0131 A82-15650
p0091 A82-17632	Wind driven fluid devices for water heating
Network wind power over the Pacific northwest.	p0134 A82-17639 Water-pumping-windmill designs: A handbook
Appendix 1: Wind statistics summaries for the wind power data stations	[DE81-904016] p0137 N82-10536
[DE81-029291] p0112 N82-13518	WINDOWS (APERTURES)
WIED SHEAR A two-dimensional study of the maximum power that	Optical degradation of antireflective sılica film on solar collector windows
can be obtained from a wind turbine in a wind	p0041 A82-10836
shear layer	Comparison of residential window distributions and
[PPA-134] p0140 N82-12537 WIED TOWNEL TESTS	effects of mass and insulation [DE81-027938] p0017 N82-12283
The effect of shielding on the aerodynamic	WINDPOWER UTILIZATION
performance of Savonius wind turbines p0125 A82-11826	Alternative power sources for residential air-conditioning systems
First results from the UMass wind tunnel test	p0039 A82-10331
program for windpowered generator optimization	Net energy analysis of small wind energy
PO134 A82-17643	conversion systems p0121 A82-11389
Wind ripple analysis	Utilization of wind/solar energy in generating
[DE81-030129] p0138 N82-11044	electricity in Saudi Arabia
Utility operating strategy and requirements for	Review of electrochemical energy conversion and
the wind power forecast	storage for ocean thermal and wind energy systems
[AIAA PAPER 81-2539] p0127 A82-14007 Wind energy for the Federal Republic of Germany	p0126 A82-11832 Analysis of electric utility investments into wind
P0130 A82-14358	power
Analytical solution of a simulation model for wind turbines	[AIAA PAPER 81-2537] p0003 A82-14006 Implementation of a siting methodology for utility
p0132 A82-16600	size WECS in western Massachusetts and
Alcoa Vertical axis wind turbines	northwestern Connecticut
p0133 A82-17628 Wind energy conversion system design and analysis	[AIAA PAPER 81-2540] p0091 A82-14008 Cost estimates for advanced/innovative wind energy
program	conversion systems /AWECS/
p0133 A82-17630 Characteristics of vertical wind profiles at	[AIAA PAPER 81-2557] p0128 A82-14016 Rotor speed control by automatic yawing of
windpowered turbine sites	two-bladed wind turbines with passive cyclic
p0091 A82-17632	pitch variation
Overview of the Wind Energy Application Network for Hawaii	[AIAA PAPER 81-2570] p0129 A82-14027 Lightning protection for wind turbine electronics
p0133 A82-17634	[AIAA PAPER 81-2571] p0129 A82-14028
Yaw dynamics of a horizontal axis wind turbine p0133 A82-17637	Wind ripple analysis [AIAA PAPER 81-2580] p0129 A82-14033
A two-dimensional study of the maximum power that	One viewpoint concerning unit size in the
can be obtained from a wind turbine in a wind shear layer	development of wind turbines p0131 A82-14845
[FFA-134] p0140 N82-12537	American Wind Energy Association, National
Network wind power over the Pacific northwest.	Conference, Pittsburgh, PA, June 8-11, 1980,
Appendix 1: Wind statistics summaries for the wind power data stations	Proceedings p0132 A82-17626
[DE81-029291] p0112 N82-13518	Energy potential and early operational experience
Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627	for large wind turbines p0132 A82-17627
Wind speed simulation for economic evaluation of	Application of large and small wind turbine
wind energy conversion systems	generators - A utility perspective
[DE81-030077] p0119 N82-15560 WIND VELOCITY MEASUREMENT	p0133 A82-17629 Overview of the Wind Energy Application Network
Performance testing of a Savonius windmill rotor	for Hawaii
in shear flows p0125 A82-11827	p0133 A82-17634 Wind energy and the Nation's rural electric systems
Evaluation of wind turbine generator operational	p0091 A82-17645
hysteresis using 'Method of Bins'	Security assessment of power systems including energy storage and with the integration of wind
WINDMILLS (WINDPOWERED MACHINES)	energy storage and with the integration of wind
Application of orthotropic plate theory to	[DE81-030166] p0140 N82-12590
windmill blade design p0121 A82-10978	Spectra over complex terrain [DB81-028734] p0112 N82-13473
The effect of shielding on the aerodynamic	Network wind power over the Pacific northwest.
performance of Savonius wind turbines p0125 A82-11826	Appendix 1: Wind statistics summaries for the wind power data stations
Performance testing of a Savonius windmill rotor	[DE81-029291] p0112 M82-13518
in shear flows	Wind Power: Research on network wind power over
p0125 A82-11827 Siting and land-use considerations in wind energy	the Pacific northwest. Executive summary [DE81-029360] p0142 N82-13519
development	Application of Bayesian analysis for wind energy
[AIAA PAPER 81-2541] p0003 A82-14009 A modular simulation model for a wind turbine system	site evaluation p0113 N82-13619
[AIAA PAPER 81-2558] P0128 A82-14017	p

Application of large and small wind turbine Numerical wind-speed simulation model qenerators - A utility perspective p0113 N82-13627 [DE82-000956] p0113 N82-13 wind speed simulation for economic evaluation of p0133 A82-17629 wind energy conversion systems [DB81-030077] Wind energy conversion system design and analysis p0119 N82-15560 p0133 A82-17630 WINDPOWERED GENERATORS Small sodium sulfur battery for solar and wind Lightning protection for composite rotor blades -- of windpowered turbines eaergy systems p0047 A82-11778 p0133 A82-17631 Characteristics of vertical wind profiles --- at Establishment of noise acceptance criteria for windpowered turbine sites wind turbines p0125 A82-11825 p0091 A82-17632 An overview of fatigue failures at the Rocky Plats Operations of small wind turbines on a Wind System Test Center distribution system p0133 A82-17633 p0125 A82-11828 A vertical axis cyclogiro type wind-turbine with freely-hinged blades Enertech High Reliability prototype vibration analvsis p0125 A82-11829 p0 133 A82-17635 Evaluation of wind turbine generator operational hysteresis using 'Method of Bins' Utilization of wind/solar energy in generating electricity in Saudi Arabia p0133 A82-17636 p0049 A82-11830 Design considerations for small wind energy Yaw dynamics of a horizontal axis wind turbine p0133 A82-17637 conversion and storage systems Experiences with a Grumman windstream 25 --p0126 A82-11831 Variable speed wind turbine control system horizontal axis wind turbine p0127 A82-11859 p0134 A82-17638 Utility operating strategy and requirements for Development of high-performance, high-reliability the wind power forecast
[AIAA PAPER 81-2539] windpower generators p0134 A82-17640 P0127 A82-14007 Wind turbine assisted diesel generator systems Analytical evaluation of the aerodynamic [AIAA PAPER 81-2559] p0128 A82-14018 performance of a high-reliability vertical-axis Methodology for the evaluation of aerodynamic wind turbine p0134 A82-17641 Controlled velocity testing of small wind energy conversion systems - An evaluation of a technique performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] p0128 1 The transformation of wind energy by a high p0128 A82-14019 p0134 A82-17642 altitude power plant /HAPP/ [AIAA PAPER 81-2568] Pirst results from the UMass wind tunnel test p0128 A82-14025 program --- for windpowered generator optimization The stability of a tethered gyromill [AIAA PAPER 81-2569] p0134 A82-17643 SWECS technology - State-of-the-art and achievable p0129 A82-14026 goals --- Small Wind Energy Conversion Systems aeroelastic analysis of the Darrieus wind turbine p0129 A82-14029 p0134 A82-17644 [AIAA PAPER 81-2572] p0129 A82-Up- and down-wind rotor half interference model Performance testing and rating standards for Wind for VAWI --- Vertical Axis Wind Turbines Energy Conversion Systems p0135 A82-17646 [AIAA PAPER 81-2579] P0129 A82-14031 Wind ripple analysis Performance of a small low speed Darrieus type rotor p0136 A82-18328 [AIAA PAPER 81-2580] p0129 A82-14033 Aerodynamic loads and rotor performance for the An indoor blade test facility for determining the basic aerodynamic properties of Darrieus wind turbine airfoils with test results for an NACA Darrieus wind turbines [AIAA PAPER 81-2582] review of rain erosion problems for aerogenerators 0015 and a modified section p0136 N82-10005 Residual stresses in darrieus vertical axis wind p0130 A82-14356 Wind energy for the Pederal Republic of Germany p0130 A82-14358 turbine blades [DE81-1026144] p0136 N82-10434 Energy transfer in wind-assist electric power Large wind turbine generator performance p0130 A82-14359 assessment, technology status report no. [DB81-903763] p0137 p0137 N82-10524 A numerical model for the flow within the tower of a tornado-type wind energy system Analysis of data from the US Department of Energy's meteorological validation program p0131 A82-14844 p0097 N82-10655 One viewpoint concerning unit size in the [DE81-030100] development of wind turbines Wind ripple analysis [DE81-030129] p0138 N82-11044 p0131 A82-14845 Incorporation and impact of a wind energy Yawing of wind turbines with blade cyclic pitch conversion system in generation expansion planning variation [DB81-030091] p0004 A82-15068 p0138 N82-11045 Potential dynamic impacts of wind turbines on Project demonstration of wind-turbine electricity: Interconnecting a northern Michigan fruit farm utility systems with a major utility p0131 A82-15071 Wind-energy recovery by a static Scherbius p0138 N82-11380 [DE81-030950] Site selection for small wind energy conversion systems for US Department of Energy field induction generator p0131 A82-15650 evaluation program [PB81-226862] Analytical solution of a simulation model for wind A two-dimensional study of the maximum power that p0132 A82-16600 Computational analysis of diffuser-augmented wind can be obtained from a wind turbine in a wind turbines snear layer [PFA-134] p0132 A82-16743 p0140 N82-12537 American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings Vertical-axis wind-turbine control strategy p0141 N82-12591 [DE81-031932] German-Argentine experiment: Vertical-rotor wind p0132 A82-17626 engine Energy potential and early operational experience p0141 N82-12648 Aluminum blade development for the Mod-OA for large wind turbines 200-kilowatt wind turbine p0132 A82-17627 [NASA-TH-82594] Alcoa vertical axis wind turbines p0143 N82-14633 Wind speed simulation for economic evaluation of p0133 A82-17628

wind energy conversion systems [DE81-030077]

D0119 N82-15560

WINDPOWERED PUMPS Water-pumping-windmill designs: A handbook [DE81-904016] p0137 p0137 N82-10536 WING PLOW METHOD TESTS Wing design for light transport aircraft with improved fuel economy p0004 A82-14416 WING TANKS Experimental study of fuel heating at low temperatures in a wing tank model, volume 1 [NASA-CR-165391] p0100 N82-11224 WISCONSIN SOLPLAN report: An assessment of barriers and incentives to conservation and alternative-energy use in the residential sector in Wisconsin [DOE/CS-30292/3] p0013 N82-11614 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DB81-030356] p0019 N82-12604 HOOD Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272 MASEC industrial fuel-wood program [DB82-000461] p0110 N82-12595 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] Thermochemical production of liquids from biomass [DB81-030085] p0117 N82-15 Assessment of the long-range transport of p0117 N82-15226 residential woodstove fine-particulate emissions for two future United States energy scenarios [DB81-030096] p0033 N82-15613 WORKING PLUIDS Analysis of power, mass, and size parameters of solar wapor-turbine two-circuit systems with organic working bodies p0044 A82-11421 Brayton cycle using dissociating nitrosyl chlorade p0126 A82-11852 The effect of variable fluid properties on scale modeling --- of solar central receivers Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] WYOHING Geologic applications of thermal-inertia mapping from satellite --- Powder River, Nyoming; Cubeza Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 YARING MOMENTS Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation
[AIAA PAPER 81-2570] p0129 A82-14027 Yaw dynamics of a horizontal axis wind turbine p0133 A82-17637 Yawing of wind turbines with blade cyclic pitch variation Variation . [DE81-030091] p0138 N82-11045 TELLOWSTONE MATIONAL FARK (ID-MT-WY)
Geologic applications of thermal-inertia mapping
from satellite --- Powder River, Wyoming; Cubeza
Prieta, Arizona, and Yellowstone National Park [E82-10011] p0118 N82-15489 **YIELD** H-coal process improvement study. Bench unit baseline run with preheater/reactor [DB81-026022] p0094 N82-10260

Z

ZINC OXIDES
Zn0 - p-InP heterojunction solar cells
p0051 A82-12821
Zn3P2 as an improved semiconductor for
photovoltaic solar cells
[DE81-025587] p0069 M82-11577

ZINC-CHLORIBE BATTERIES
Life-testing of 1.7 kW h zinc-chloride battery
system - Cycles 1 - 1000

p0155 A82-18498

ZIRCONIUM COMPOUNDS
Solar selective properties and high temperature
stability of CVD ZrB2

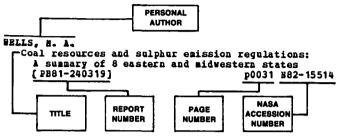
p0057 A82-16055

PERSONAL AUTHOR INDEX

ENERGY / A Continuing Bibliography (Issue 33)

APRIL 1982

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document cited (e.g., NASA report, translation, NASA contractor report). The page and accession numbers are located beneath and to the right of the title. Under any one author's name the accession numbers are arranged in sequence with the AIAA accession numbers appearing first.

AMODT, B. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024]

D0105 N82-11715 ABBATIBLEO, L. A.
Seasonal performance factors for active solar

systems and heat-pump systems [DE81-028569] p0074 N82-12625

ABDELKHIM, M.
A practical method of analysis of the

current-voltage characteristics of solar cells p0051 A82-12823

Thin-film polycrystalline cadmium telluride solar cells and large-area rclycrystalline silicon solar cells

D0062 N82-10490

ABDURAKHMANOV, A. Efficiency of selective surfaces for solar thermal collectors

p0044 A82-11425 ABDURAKHMANOV, B. M.
Production and certain properties of photoelectric

cells based on silicon epitaxial structures p0053 A82-13716 ABHAT, A. Development of a modular heat exchanger with

integrated latent heat energy store [BMFT-FB-T-81-050]

ABOU-ZEID, M. R. A simplified method for direct calculation of the annual load fraction of solar systems for space heating

Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 A82-15726

ACHILOV. B. M. Method for calculating the unsteady temperature conditions of the generator in a solar

refrigeration system p0056 A82-15642

High performance silicon solar arrays employing advanced structures

D0045 A82-11758 ADAMS, M. A. Fracture mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 ADAMS. R. C. Demonstration of Wellman-Lord/Allied Chemical PGD Demontration test second year results technology: [PB81-246316] D0034 N82-15626

AGARWAL, A. K.
Pricetown 1 underground coal gasification field test: Operations report [DE81-025162]

AGNIHOTRI, O. P. Spectrally selective copper sulphide coatings p0040 A82-10468

AHMAD, J.
Evaluation of organic acids as fuel cell electrolytes

p0127 A82-12938

Performance of a small low speed Darrieus type rotor p0136 A82-18328

AIMAN. W. R. Solar coal-gasification reactor for hydrocarbon-free synthesis gas

p0067 N82-11247 [DE81-026600] Design and test of two-step solar oil shale retort [DE82-000964] p0077 N82-13543

AKHMEDOV, P. A. Investigation of the possibility of using inexpensive concentrating systems in the modules of a photoelectric station

p0052 A82-13713

AKINS. R. B. Wind ripple analysis [AIAA PAPER 81-2580]

p0129 A82-14033 Wind ripple analysis p0138 N82-11044

[DE81-030129] ALDEN, D. R. Pield demonstration of the conventional steam drive process with ancillary materials [DE81-026849] p0115 N8:

p0115 N82-14522 ALDIS, D. F.

Solar-supplemented, natural air drying of shelled corn: The economic limitations
[PB81-235681] p0
ALDRICH, J.
Hot dry rock geothermal prospects, 1981 p0079 N82-14668

p0119 N82-15559 [DE81-025305] ALI, A. P.

Optical diagnostic techniques for coal-fired MHD applications [AÎAA PAPER 82-0377] p0135 A82-17913

ALIEV, R. Production and certain properties of photoelectric cells based on silicon epitaxial structures p0053 A82-13716

ALLWINE. K. J. Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest

p0024 N82-13535 [DE82-000705] ALLWINE, K. J., JR. Assessment of the long-range transport of residential woodstove fine-particulate emissions

for two future United States energy scenarios [DE81-030096] ALVARES, N. J. Pire-protection research for energy technology:

Py 80 year end report [DB82-000970] p0161 N82-14649 AMBERG, H. U.

Practical demonstration of heat pumps for utilization of animal-generated heat p0017 N82-12403 [BMFT-FB-T-80-100]

AMBRUS, J. H. Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755

AMOH, D. M.	annow n o
m	ARREY, B. H.
Project demonstration of wind-turbine electricity:	Hot dry rock geothermal prospects, 1981
Interconnecting a northern Michigan fruit farm	[DE81-025305] p0119 N82-15559
with a major utility	ARORA, J. D.
[DB81-030950] p0138 N82-11380	Dependence of minority carrier diffusion length on
ABANDALINGAN, G.	illumination level and temperature in single
Project impact analysis as an optimal control	crystal and polycrystalline Si solar cells
problem	p0053 A82-13804
[DB81-028465] p0021 N82-12842	ARORA, H. K.
ANDER, M. B.	Grain size dependence of the photovoltaic
Hot dry rock geothermal prospects, 1981	properties of solar grade polysilicon
[DE81-025305] p0119 N82-15559	p0057 A82-16051
ANDERSON, B.	ASH, D. L.
Incremental cooling load determination for passive	Geothermal reservoir assessment: Northern basin
direct gain heating systems	and range province Stillwater prospect,
[DE81-029882] p0081 N82-15575	Churchill County, Nevada
ANDERSON, J. B.	[DE82-000529] p0109 N82-12516
An energy saving transit concept for new towns	ASHARE, E.
p0005 A82-15665	Blomethanation of biomass pyrolysis gases
ANDERSON, F.	[DE82-000238] p0113 N82-13541
Peat resource evaluation: State of Maine	ASHMAN, E. N.
	Solar energy system performance evaluation:
	Montecito Pines, Santa Rosa, California,
AUDERSSON, B.	
Verification of BLAST by comparison with	November 1979 - April 1980
measurements of a solar-dominated test cell and	[DE81-028175] p0068 N82-11561
a thermally massive building	ASMON, I.
[DB81-029883] p0082 N82-15578	Market assessment of photovoltaic power systems
ANDREEV, V. H.	for agricultural applications in Mexico
Gallium-arsenic-antimony heterojunction photocells	[NASA-CR-165441] p0007 N82-10506
p0055 A82-14667	Market assessment of photovoltaic power systems
ANDREWS, J. W.	for agricultural applications in Morocco
DOE solar-assisted heat-pump program: Its	[NASA-CR-165477] p0077 N82-14627
evolution and its potential	ATHEY, G. P.
[DE81-026055] p0067 N82-11413	Numerical wind-speed simulation model
ANDRYCZYK, R. W.	[DE82-000956] p0113 N82-13627
Rectenna system design	Wind speed simulation for economic evaluation of
p0149 N82-12561	wind energy conversion systems
ANG, P. G. P.	[DE81-030077] p0119 N82-15560
Electrochemical photovoltaic cells	ATOR, J. T.
[DE81-769704] p0066 N82-10568	A method for preliminary evaluation and sizing of
ANGERMAN, A.	solar thermal cogeneration system applications
Overview of active solar absorption/Bankine	[AIAA PAPER 81-2551] p0054 A82-14014
cooling program	AUDAS, B.
[DE81-028041] p0082 N82-15577	Investigation of the performance of an
ANGUS, H. C.	MoS2/I-/I2/C electrochemical solar cell
Rechargeable metallic hydrides for hydrogen storage	p0053 A82-13805
p0085 A82-17150	AUSTIE, S.
ANGUIN, M. J.	Parallel evaluation of air-and oxygen-activated
Development of a high-temperature durable catalyst	sludge
tor use in catalytic combustors for advanced	F PB8 1-2467121 nnn34 N82-15633
for use in catalytic combustors for advanced	[PB81-246712] p0034 N82-15633
automotive gas turbine engines	AVERY, W. H.
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510	AVERY, W. H. Alternative ocean energy products and hybrid
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. R.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPEE 81-2547] p0128 A82-14012
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H.
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARIST, R. R. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPEE 81-2547] p0128 A82-14012 AVAYA, H. Configuration selection study for isolated loads
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. R. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, B. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPEE 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPEE 81-2549] p0061 A82-18223 AYAD, S. S.
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUE, J.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUS, J. Performance analysis of d.cmotor-photovoltaic	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUE, J.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUS, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A.
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUM, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPEE 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPEE 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system AYER, F. A. Symposium proceedings: Environmental aspects of
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A.
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUM, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 N82-10385 System of tolerances for a solar-tower power station p0053 N82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 N82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods System of tolerances for a solar-tower power station p0053 A82-13717 APPRIBAUS, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUS, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AVAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and shunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, E. J.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods System of tolerances for a solar-tower power station p0053 A82-13717 APPRIBAUS, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen P0084 A82-11790 ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUM, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Plue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and shunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIB, A. C.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Flue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B.
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and shunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, H. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIE, A. C. Jet fuel from carbon	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Plue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPRIBAUM, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, H. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIE, A. C. Jet fuel from carbon	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AVAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, H. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIB, A. C. Jet fuel from carbon p0090 A82-12021 ARMSTRONG, R. C.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Flue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and shunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, H. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIB, A. C. Jet fuel from carbon p0090 A82-12021 ARMSTRONG, R. C. Energy conservation in distillation	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Flue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3:
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPRIBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIPULIA, A. C. Jet fuel from carbon p0090 A82-12021 ARMSTRONG, R. C. Energy conservation in distillation [DE81-028650] p0018 N82-12581	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DB81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUM, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIM, A. C. Jet fuel from carbon p0090 A82-12021 ARMSTRONG, R. C. Energy conservation in distillation [DB81-028650] ARNDT, G. D.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DR81-030982] Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and shunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, H. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIB, A. C. Jet fuel from carbon p0090 A82-12021 ARMSTRONG, R. C. Energy conservation in distillation [DB81-028650] p0018 N82-12581 ARNDT, G. D. Antenna optimization and cost consideration for	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Flue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIB, A. C. Jet fuel from carbon p0090 A82-12021 ARMSTRONG, R. C. Energy conservation in distillation [D881-028650] p0018 N82-12581 ARNDT, G. D. Antenna optimization and cost consideration for the Solar Fower Satellite microwave system	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4:
automotive gas turbine engines [NASA-CR-165396] APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] ARISTRONG, R. C. Beergy conservation in distillation [DE81-028650] ARENDT, G. D. Antenna optimization and cost consideration for the Solar Power Satellite microwave system p0145 A82-11744	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV
automotive gas turbine engines [NASA-CR-165396] APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods P0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors P0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen P0084 A82-11790 ARGOUD, H. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] P0054 A82-14005 ARIFULIB, A. C. Jet fuel from carbon P0090 A82-12021 ARMSTRONG, R. C. Energy conservation in distillation [DB81-028650] ARNDT, G. D. Antenna optimization and cost consideration for the Solar Power Satellite microwave system P0145 A82-11744 System performance conclusions	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Flue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual
automotive gas turbine engines [NASA-CR-165396] APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods P0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors P0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen P0084 A82-11790 ARGOUD, H. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] ARIFULIB, A. C. Jet fuel from carbon P0090 A82-14005 ARHSTRONG, R. C. Energy conservation in distillation [DR81-028650] ARHOT, G. D. Antenna optimization and cost consideration for the Solar Fower Satellite microwave system P0145 A82-11744 System performance conclusions	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Flue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIB, A. C. Jet fuel from carbon p0090 A82-12021 ARMSTRONG, R. C. Energy conservation in distillation [DE81-028650] p0018 N82-12581 ARNDT, G. D. Antenna optimization and cost consideration for the Solar Fower Satellite microwave system p0145 A82-11744 System performance conclusions AREDT, R. A.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5:
automotive gas turbine engines [NASA-CR-165396] APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUN, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen p0084 A82-11790 ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] P0054 A82-14005 ARIFULIN, A. C. Jet fuel from carbon p0090 A82-12021 ARMSTRONG, R. C. Energy conservation in distillation [DB81-028650] ARNDT, G. D. Antenna optimization and cost consideration for the Solar Power Satellite microwave system p0145 A82-11744 System performance conclusions AREDT, R. A. High- and low-resistivity silicon solar cells	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system P0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV
automotive gas turbine engines [NASA-CR-165396] p0142 N82-13510 APARISI, R. B. Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 System of tolerances for a solar-tower power station p0053 A82-13717 APPELBAUB, J. Performance analysis of d.cmotor-photovoltaic converter system. II - Series and snunt excited motors p0043 A82-11213 ARGABRIGHT, T. A. Lightweight hydrides for automotive storage of hydrogen ARGOUD, M. J. Solar concentrator panel and gore testing in the JPL 25-foot space simulator [AIAA PAPER 81-2534] p0054 A82-14005 ARIFULIB, A. C. Jet fuel from carbon p0090 A82-12021 ARMSTRONG, R. C. Energy conservation in distillation [DE81-028650] p0018 N82-12581 ARNDT, G. D. Antenna optimization and cost consideration for the Solar Fower Satellite microwave system p0145 A82-11744 System performance conclusions AREDT, R. A.	AVERY, W. H. Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants [AIAA PAPER 81-2547] p0128 A82-14012 AWAYA, H. Configuration selection study for isolated loads using parabolic dish modules [AIAA PAPER 81-2549] p0061 A82-18223 AYAD, S. S. A numerical model for the flow within the tower of a tornado-type wind energy system p0131 A82-14844 AYER, F. A. Symposium proceedings: Environmental aspects of fuel conversion technology, 5th [PB81-245045] p0034 N82-15623 Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB81-243156] p0035 N82-15651 Proceedings: Symposium on Plue Gas Desulfurization, volume 2 [PB81-243164] p0035 N82-15652 AYERS, J. B. Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5:

В		
BACCRI, B. C.		
Solar explosion [DE81-026086]	p0074	N82-12628
BACHMANN, K. J.	_	
Oxide optimization at the p-Si/aqueou interface	s elec	trolyte
	p0052	A82-13199
BACK, L. H. Dish stirling solar receiver combusto	r test	Drogram
[NASA-CR-165017]		N82-13495
BACKNORST, J. R. Puel and energy		
	p0004	A82-1558 9
BACON, C. P. Resource assessment of Low and		
Moderate-temperature geothermal wat	ers in	ı
Calistoga, Napa County, California [DE81-025559]	n0109	N82-12518
BADER, J. B.	-	
Measurement of thermal conductivities [DE82-000523]		al fluids 182-12400
BARS, C. P., JR.	_	
Response of the oceans to increasing carbon dioxide	atmosp	heric
[DE81-028178]	p0025	N82-13558
BAILEY, B. H. Characteristics of vertical wind prof	iles	
	p0091	A82-17632
Site selection for small wind energy systems for US Department of Energy		
evaluation program		
[PB81-226862] BAIRAHOV, A. H.	p0014	N82-11624
Regime characteristics of a solar the		
generator and comparison of experime calculated data	ental	and
	p0040	A82-10390
BAIRAMOV, R. Thermal deformation of concentrators	in an	
antisymmetric temperature field		
BAKER, D. C.	p0062	A82-18698
Solid-solid reactions in coal convers		
BAKER, E. G.	p0107	N82-12238
Transportation fuels from synthetic g		
[DE81-029614] BAKER, M. S.	p0102	N82-11258
Passive solar technical planning stud		
[EPRI-EM-1591] BAKER, R. W.	p0072	N82-12578
Network wind power over the Pacific n		
Appendix 1: Wind statistics summar wind power data stations	ies fo	or the
[DB81-029291]		N82-13518
Wind Power: Research on network wind the Pacific northwest. Executive s		
[DE81-0293601		N82-13519
BAKSTAD, P. J. Proposed 12.5 HWe shelf-mounted OTEC	nilot	nlan+
for power, water and mariculture at	St. (TOLE
[AIAA PAPER 81-2546] BALCERAK, J. C.	p0127	A82-14011
Controlled velocity testing of small		
conversion systems - An evaluation		echnique 182-17642
BALCOMB, J. D.	•	
State of the art in passive solar hea [LA-UR-81-2185]		N82-10537
Heat storage duration	-	
[DE81-026635] BALDWIN, R. A.	p0070	N82-11602
Process development for improved SRC		ıs.
Kerr-McGee critical solvent deashin fractionation studies	g and	
[DE81-903785]	p0114	N82-14380
BALRO, E. H. Balogen acid electrolysis in solid po	lymer	
electrolyte cells	-	
BALL, G. L., III	p0384	A82-16346
Low-cost mirror concentrator based on	infla	ted.

double-walled, metallized, tubular films

p0081 N82-15551

[DE81-027813]

```
BALLINGER, M. Y.
Numerical wind-speed simulation model
      f DE82-0009561
                                                p0113 N82-13627
    Wind speed simulation for economic evaluation of
      wind energy conversion systems [DE81-030077]
                                                p0119 N82-15560
BALTISBERGER, R. J.
Chemistry of lignite liquefaction
[DE81-030178]
                                                p0093 N82-10249
BANKSTON, C. P.
   Dish stirling solar receiver combustor test program
      [NASA-CR-165017]
                                                p0076 N82-13495
BAR-ILAN, A.
   Energy savings by means of fuel-cell electrodes in electro-chemical industries
      [DE81-030975]
                                                p0018 N82-12582
BARAONA, C. R. Solar cell development for the Power Extension
      Package
                                                p0046 A82-11763
   Solar cell development for the power extension
      package
[NASA-TM-82685]
                                                p0068 N82-11551
BARATTINO, W. J.
    Alternative transportation vehicles for
      military-base operations
                                                p0005 A82-16348
    Mechanical energy storage technology project
                                                p0155 N82-10508
      [DE81-029753]
    Mechanical Energy Storage Technology (MEST)
      development
[DE81-026800]
                                                p0158 N82-11596
BARNETT, R. H.
A preliminary estimate of future communications
      traffic for the electric power system [NASA-CR-165015] p0
                                                p0024 N82-13493
BARNEY, D. L.
    Recent progress in lithium/iron sulfide battery
      development
      [DE81-023127]
   Calcium/metal sulfide battery development program
[ANL-81-14] p0158 N82-11578
      [ANL-81-14]
BARON, J. L.
Alternate hybrid power sources for remote site
      applications
      [AD-A099471]
                                                p0024 N82-13512
BARR.
       K. P.
    Buffer thermal energy storage for a solar Brayton
      engine
      [AIAA PAPER 81-2531]
                                                p0053 A82-14002
BARTH, E. A. EPA evaluation of the PUEL-MAX device under
      Section 511 of the Motor Vehicle Information and
      Cost Savings Act
      F PB81-2298661
                                                D0012 N82-11479
    BPA evaluation of the Automotive Cylinder
Deactivator System (ACDS) under Section 511 of
the Motor Vehicle Information and Cost Saving Act
                                                p0013 N82-11480
      [PB81-228256]
BARTHOLOMEN, R. J.
Pailure mode analysis using state variables
derived from fault trees with application
      [DE81-030239]
BARTLÎT, J. R.
    Cool-down flow-rate limits imposed by thermal
      stresses in LNG pipelines [DE81-028731]
                                                p0150 N82-14484
BASU, S.
    Proposed experimental studies for assessing
      ionospheric perturbations on SPS uplink pilot
      beam signal
                                                p0147 N82-12543
    Proposed experimental studies for assessing
      ionospheric perturbations on SPS uplink pilot
      beam signal
                                                D0147 N82-12543
BATCHELDER, J. S.
Luminescent solar concentrators. II - Experimental
      and theoretical analysis of their possible
      efficiencies
                                                p0052 A82-13285
BAUDER, H. J.
    Air circuit with heating pump [BMPT-FB-T-80-188]
                                                p0017 N82-12404
BAUER, J. V.
    Catalyst and reactor development for a
      liquid-phase fischer-tropsch process
                                                p0099 N82-11168
      f DE81-0282091
```

BAUBE, M.
HHD coal combustor development p0135 A82-17914 [AIAA PAPEE 82-0380] BAUM, I. V. Mathematical simulation model for the operation of the optical system of a solar power station p0053 A82-13718 The universal plane method for calculating the dimensions of heliostats p0062 A82-18697 Verification of BLAST by comparison with measurements of a solar-dominated test cell and a thermally massive building [DE81-029883] D0082 N82-15578 BAUHAN, L. B. Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPEE 82-0377] p0135 A82-17913 BAVINGER, B. A.

Relational methodology for integrating and
analyzing field test and research data
describing enhanced oil recovery [DB81-030441] p0118 N82-15508 BAITER, V. D. Annual cycle energy system experimental performance and national applicability [DB81-028570] p0024 N82-13523 BAYLY, D. A.
A vertical axis cyclogiro type wind-turbine with freely-hinged blades p0125 A82-11829 BEACH, C. D. Photovoltaics, the solar electric solution p0050 A82-12532 BEAL, G. LOW NO sub x heavy fuel combustor concept program
[NASA-CR-165512] p0140 N82-12572 [NASA-CR-165512] BEASON, D. G.
Fire-protection research for energy technology: Py 80 year end report [DE82-000970] p0161 N82-14649 BEATTY, R. Energy end-use requirements in manufacturing, volume 1 [DB81-028975] p0064 N82-10512 Energy end-use requirements in manufacturing, volume 3 [DE81-027976] p0007 N82-10544 BEAUCHAMP, R. B. Experimental and analytical investigation of a fluidic power generator [JPL-PUB-81-100] p0142 N82-13386 BECHTEL, A. Preliminary investigation on a primary energy saving heat supply system for the residential district "Maria Lindenhof" in Dorsten, West Germany [BHFT-FB-T-80-157] p0008 #82-10572 BECK. Potential environmental problems of enhanced oil and gas recovery techniques
[PB81-240186] p0034 N82-19 p0034 N82-15637 BECLA, P. Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors p0136 A82-18466 BEDAIR, S. H.
The development of high efficiency cascade solar cells - An overview p0047 A82-11794 BEDWELL, I. R. The use of semiconducting oxide ceranics in solar energy conversion p0059 A82-17099 Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification p0127 A82-12113 BEGG, L. L. Jet impingement heat transfer enhancement for the GPU-3 Stirling engine [NASA-TH-82727] p0140 N82-11993 BBGLEY, D. L.
Lightning protection for wind turbine electronics

p0129 A82-14028

BRITING, E. J. Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-03771 p0135 A82-17913 BELL, D. J. Potential dynamic impacts of wind turbines on utility systems p0131 A82-15071 BELL, R. A. The electric utility 4.5 MW fuel cell power plant
- An urban demonstration p0131 A82-15070 BELL, R. B. Possible use of coal in Hawaii, 1980 - 2000 [DB81-028266] p0010 N82-11263
Methodology and basic algorithms of the Livermore
Economic Modeling Systems [DE81-029430] p0035 N82-15833 BELL, S. E. Biomass energy systems: Descriptions and employment requirements for typical operations [DB82-000236] p0113 N82-13538 Education and training implications of biomass energy system use
[DE81-029956] p0028 N82 BELLECCI, C. A simplified model of the thermohydraulic behaviour of a linear collector network for the conversion of the solar energy p0062 A82-18816 BELLER, M. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] n0087 N82-15220 BENDER, T. M. Ion exchange characteristics of enhanced oil recovery systems (miscibility studies) [DE81-769734] p0096 N82-10478 BENNETT, G. L. Nuclear electric power for space systems -Technology background and flight systems program p0123 A82-11756 BENTS, D. J. Impact of uniform electrode current distribution on ETP [AIAA PAPER 82-0423] DO135 A82-17941 Magnetohydrodynamics (MHD) Engineering Test Facility (ETF) 200 MWe power plant. Design Requirements Document (DRD) f NASA-TM-827051 D0140 N82-12446 BERCAW, R. W.

Hagnetohydrodynamics (MHD) Engineering Test
Pacility (ETF) 200 MWe power plant. Design
Requirements Document (DRD) [NASA-TH-82705] DO 140 N82-12446 BERG, L. Catalytic hydrogenation of coal-derived liquids
[DE81-030485] p0106 N82-12198 BERGER, M. J. Application of large and small wind turbine generators - A utility perspective D0133 A82-17629 BERGEY, K. H.
Development of high-performance, high-reliability windpower generators p0134 A82-17640 BERGEY. M. Performance testing and rating standards for Wind Energy Conversion Systems p0135 A82-17646 BERGHAN, S. A modular simulation model for a wind turbine system [AIAA FAPER 81-2558] p0128 A82-14017 BERGTHOLD, F. M., JR.
Control system development for a 1 MW/e/ solar thermal power plant p0048 A82-11801 BERLINGHOFF, K.
Preliminary investigation on a primary energy saving heat supply system for the residential district "Maria Lindenhof" in Dorsten, West Germany [BMPT-FB-T-80-157] p0008 N82-10572 Material property data and their use in design and analysis for an elevated temperature solar code p0055 A82-14847

[AIAA PAPER 81-2571]

BERMAN, I. A.	
Planning an underground pumped hydro	project for
the Commonwealth Edison Company	p0154 A82-11847
BERMAN, p. Space applicable DOE photovoltaic tec	hnology: An
update	
[NASA-CR-165021]	p0076 N82-13491
Urban ecosystem and resource-conserva	ing urbanism
in Third World cities [DB81-029854]	p0016 N82-11995
BERHAL, L.	-
Experimental and analytical investigation fluidic power generator	serion of 4
[JPL-PUB-81-100] BRRHTELL, J.	p0142 N82-13386
Conceptual design of a large coal-fir	red stationary
Stirling engine	p0123 A82-11806
BERRY, G.	
Problems and potential for MHD retro: existing coal-fired plants	fit of
[AIAA PAPEE 81-2586]	p0130 A82-14036
BERS, A.	
RF-driven Tokamak reactor with sub-19 thermally stable operation	gnited,
[DB81-029437]	p0139 N82-11935
BESEEBRUCH, G. B. The GA sulfur-iodine water-splitting	process - A
status report	-
BEST, R. H.	p0084 A82-11844
The development and design of steam/	
receivers for commercial application [ASME PAPER 81-SOL-4]	ов р0042 A82-10972
BEVILACQUA, S.	-
A central tower solar test facility	/RB/CTSTF/ p0048 A82-11797
BEWER, B.	-
Energy consumption analysis and compa of the operational results from her	
[BMFT-FB-T-80-105]	p0032 N82-15583
BHARATHAM, D. Measured performance of falling-jet:	flash
evaporators	
[DE81-024355] BHARDWAJ, R. P.	p0161 N82-10565
Model based studies of some optical	and electronic
properties of narrow and wide gap	materials p0062
BHATHAGAR, A. P.	PUV02 M02-184/1
Energy balance and utilization of ag	ricultural
waste on a farm [PB81-229262]	p0115 N82-14385
Studies on sugarcane as an energy cr	op for Punjab
[PB81-232308] BHIDE, V. S.	p0115 N82-14386
The corrosion of some superalloys in	contact with
coal chars in coal gasifier atmosp	heres p0091 182-17974
BIEHL, P. A.	-
Test results and analysis of a conve- solar air collector	ctive loop
[DR81-028151]	p0070 N82-11599
BIBHL, R. J. Aviation gasoline versus automotive	ancalina
[AIAA PAPEE 81-1705]	p0091 A82-14395
BIGGS, P. User's guide to HELIOS: A computer	program for
modeling the optical behavior of r	
solar concentrators. Part 1: Int.	roduction and
code input [DE81-031920]	p0073 N82-12616
BILICKI, E.	_
Flow in geothermal wells. Fart 4: criteria for two-phase flow patter.	
[DE81-028312]	p0096 N82-10366
BIRDSALL, T. H. Relaxing environmental standards dur	ing oil-supply
disruptions: Past, present and fu	ture
[DE81-024250] BIRKBY, J.	р0009 и82-10601
Montana geothermal handbock: A guid	e to agencies,
regulations, permits and financial geothermal development	alds for

[DE81-024315]

BIRRENBACH, R. Wing design for light transport aircraft with improved fuel economy p0004 A82-14416 BLACKLER. J. The stability of a tethered gyromill [AIAA PAPER 81-2569] p0129 A82-14026 Carrier-collection efficiencies in amorphous hydrogenated silicon Schottky-barrier solar cells p0042 A82-11185 BLAKE, T. B.
Proposed 12.5 MWe smelf-mounted OTEC pilot plant for power, water and mariculture at St. Croix [AIAA PAPER 81-2546] p0127 A82-14011 [AIAA PAPER 81-2546] BLEVINS, C. H.

Life-testing of 1.7 kW h zinc-chloride battery
system - Cycles 1 - 1000 BLIAMPTIS, T. B. Energy conservation through utilization of mechanical energy storage p0002 A82-11845 BLOCK, D. A. Transwall: A modular visually transmitting thermal storage wall p0160 N82-15579 [DE81-029821] BLOCK, D. L.
Plorida's proposed OTEC pilot plant for Key West
p0003 A82-14021 BLUESTRIN, J. An estimate of OTEC costs, market potential and proof-of-concept vessel financing
[AIAA PAPER 81-2567] p0003 A82-D0003 A82-14024 BOBBETT, R. E. Design considerations for vehicular fuel cell power plants [DE81-769737] p0138 N82-10961 BOECK, H. Improvement of thermal efficiency of flat plate solar collectors [BMFT-FB-T-80-194] p0075 N82-12642 BORGLY, W. J., JR.
Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 BOKOV, IU. V. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 BOMBAUGH, K. J. Pingerprinting pollutant discharges from synfuels plants D0001 A82-10697 BONNELL, D. W.
Vaporization and Chemical transport under coal . gasification conditions [PB81-245839] p0117 N82-15165 BONNETAIN, Y. Energy consumption and heavy-duty vehicles p0008 N82-10573 BOOK, L.
Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 BORISON, A. B. Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] p0035 N82-16012 Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model [DB81-904237] p0035 N82-16013 BORTHIKOV, IU. S.
Unconventional techniques of energy conversion BORTON, D. N. The Rogers focusing heliostat experimental program at Rensselaer Polytechnic Institute D0071 N82-11625 [PB81-226813] BOTTS, 1. B.
Applications of power beaming from space-based nuclear power stations
p0145 A82 BOURN, W. M. Sampling design for the 1980 commercial and multifamily residential building survey

[DE81-028783]

p0007 N82-10562

p0011 N82-11320

BOWNAW, M. G.	BROWN, W. C.
Improved efficiency in the sulfur dioxide - Io hydrogen cycle through the use of magnesium p0083 A82	oxide components for the solar power satellite
Use of oxide decompositions in advanced thermochemical hydrogen cycles for solar hea sources. Application of the tricobalt	The adapting of the crossed-field directional
tetraoxide-cobalt monoxide pair [DE81-030235] p0082 B82	Method for precision forming of low-cost, 2-15581 thin-walled slotted waveguide arrays for the SPS
Configuration selection study for isolated loa using parabolic dish modules	p0148 N82-125 ads The history of the development of the rectemna p0149 N82-125
[AIAA PAPER 81-2549] p0061 A82 BRACHES, E.	2-18223 BRUCE, J. L. Low-to-moderate temperature geothermal resource
Selection and testing of suitable coating syst for steel pipes used for long distance heat transfer	tems assessment for Nevada, area specific studies
[BRFT-FB-T-81-138] p0150 882	2-15134 Air circuit with heating pump [BMPT-FB-T-80-188] p0017 882-124
An analytic model of high sclidity vertical ax windwills	
p0131 A82	
Gallium arsenide solar cells-status and prospe for use in space	
p0046 A82	
Low-cost passive-solar retrofits for new and existing mobile homes	Infrared quenching of photocapacitance in Cu/x/S/CdS solar cells
[DE81-028356] p0081 H82 BRATIS, J. C.	BUCK, J. H.
Assessment of the potential of coal-fueled hea engines in total and integrated energy syste [DE82-000169] p0018 H82	ems Energy's meteorological validation program 2-12587 [DE81-030100] p0097 N82-106
BRATT, C. Conceptual design of a large coal-fired statio	onary Bydrogen as carrier of secondary energy: Proposal
Stirling engine p0123 A82	for a research and development program 2-11806 [DPVLR-MITT-81-10] p0087 N82-155
BREECH, B. L. A photovoltaic system with energy storage -	BUHERAW, R. A. Composite film selective-absorbers
Natural Bridges National Monument 100-kW sys [AIAA PAPER 82-0066] p0155 A82	stem p0038 A82-100
BRENDLE, P. Economic effects induced by ESA contracts, pha	A photovoltaic system with energy storage -
2. Volume 1: Summary	[AIAA PAPER 82-0066] p0155 A82-177
[ESA-CE(P)-1462-VOL-1] p0161 882 BREWER, G. D.	Overview of DOE's large stationary Stirling engine
Puel for future transport aircraft [ASME_PAPEE 81-HI-80] p0089 A82	
BRIAN, B. W. Catalyst and reactor development for a	SOLATTI, A. Solar power satellite system energy balance
liquid-phase fischer-tropsch process [DE81-028209] p0099 N82	
[DE01-020203] P0033 B02	2-11168 BURKE, J. C. p0050 A82-125
BRISCOB, J. B.	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat
BRISCOB, J. H. Regenerative pyroelectric heat engine p0126 A82	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps 2-11833 [DE81-024086] p0139 N82-114
BRISCOB, J. H. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps 2-11833 [DE81-024086] BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Pacility (RTF) 200 NWe power plant. Design
BRISCOB, J. S. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermi	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Pacility (ETP) 200 NWe power plant. Design Equirements Document (DBD) [NASA-TM-82705] p0140 N82-124
BRISCOB, J. H. Regenerative pyroelectric heat engine p0126 A82 BRITT, E. J. High temperature cogeneration with thermionic burners p0124 A82 The design of series-parallel connected thermi converter arrays p0124 A82	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKART, J. A. Magnetohydrodynamics (MHD) Engineering Test Pacility (ETF) 200 NWe power plant. Design 2-11817 ionic [NASA-TM-82705] BURNET, G. Power-plant fly-ash utilization: A
BRISCOB, J. S. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermi converter arrays p0124 A82 Jet impingement heat transfer enhancement for GPU-3 Stirling engine	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Facility (ETF) 200 NWe power plant. Design Requirements Document (DBD) [NASA-TM-82705] BURNET, G. 2-11820 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 882-131
BRISCOB, J. H. Regenerative pyroelectric heat engine p0126 A82 BRITT, E. J. High temperature cogeneration with thermionic burners p0124 A82 The design of series-parallel connected thermi converter arrays p0124 A82 Jet impingement heat transfer enhancement for GPU-3 Stirling engine [NASA-TH-82727] BROCKHURST, F. C.	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Magnetohydrodynamics (MHD) Engineering Test Pacility (ETF) 200 NWe power plant. Design Equirements Document (DED) [NASA-TH-82705] BURHET, G. 2-11820 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] BURNS. C. C. Effects of atmospheric variability on energy
BRISCOB, J. S. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermi converter arrays p0124 A82 Jet impringement heat transfer enhancement for GPU-3 Stirling engine [NASA-TH-82727] p0140 N82 BROCKHUEST, F. C. Pulsed Power Research colloquium [AD-A105770] p0150 N82	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Facility (ETF) 200 NWe power plant. Design Requirements Document (DBD) [NASA-TM-82705] BURNET, G. 2-11820 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] P0022 N82-131 BURNS, C. C. Effects of atmospheric variability on energy utilization and conservation [DE81-026308] P0008 N82-105
BRISCOB, J. H. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic burners p0124 A82 The design of series-parallel connected thermi converter arrays p0124 A82 Jet impingement heat transfer enhancement for GPU-3 Stirling engine [NASA-TH-82727] BROCKHUEST, F. C. Pulsed Power Research colloquium [AD-A105770] BROCKINGTON, J. W. Catalyst and reactor development for a	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Pacility (ETF) 200 NWe power plant. Design Requirements Document (DED) [NASA-TH-82705] BURNET, G. 2-11820 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-131 2-11993 BURNS, C. C. Effects of atmospheric variability on energy utilization and conservation [DE81-026308] BUSNAINA, A. A. Flow aerodynamics modeling of an MHD swirl
BRISCOB, J. S. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermi converter arrays p0124 A82 Jet impingement heat transfer enhancement for GPU-3 Stirling engine [NASA-TH-82727] p0140 N82 BROCKHUEST, F. C. Pulsed Power Research colloquium [AD-A105770] p0150 N82 BROCKINGTON, J. W. Catalyst and reactor development for a liquid-phase fischer-tropsch process [DE81-028209] p0099 N82	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Facility (ETF) 200 NWe power plant. Design Requirements Document (DBD) [NASA-TM-82705] BURNET, G. 2-11820 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] P0022 N82-131 BURNS, C. C. Effects of atmospheric variability on energy utilization and conservation [DE81-026308] BUSHAINA, A. A. Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification
BRISCOB, J. S. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermiconverter arrays Jet impringement heat transfer enhancement for GPU-3 Stirling engine [NASA-TM-82727] PUSCHUEST, F. C. Pulsed Power Research colloquium [AD-A105770] BROCKINGTON, J. W. Catalyst and reactor development for a liquid-phase fischer-tropsch process [DE81-028209] BROWISZ, S. B. Space nuclear safety and fuels program p0111 N82	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Facility (ETF) 200 MMe power plant. Design Requirements Document (DED) [NASA-TH-82705] BURNET, G. 2-11820 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] PO022 N82-131 BURNS, C. C. Effects of atmospheric variability on energy utilization and conservation [DE81-026308] BUSNAINA, A. A. Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification PO127 A82-121 BUTCHER, T. A. Coal-oil mixtures: An alternative fuel for the
BRISCOB, J. S. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermiconverter arrays p0124 A82 Jet impingement heat transfer enhancement for GPU-3 Stirling engine [NASA-TH-82727] BROCKHUEST, F. C. Pulsed Power Research colloquium [AD-A105770] BROCKINGTON, J. W. Catalyst and reactor development for a liquid-phase fischer-tropsch process [DE81-028209] BROWISZ, S. B. Space nuclear safety and fuels program p0111 N82 BROOME, K. R. Modular hydro dam approach to the economic development of ultra low-head hydropower	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Pacility (ETF) 200 NWe power plant. Design Requirements Document (DRD) [NASA-TH-82705] BURNET, G. Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] PO022 N82-131 BURNS, C. C. Effects of atmospheric variability on energy utilization and conservation [DE81-026308] BUSNAINA, A. A. Flow aerodynamics modeling of an HHD swirl combustor - Calculations and experimental verification PO127 A82-121 BUTCHER, T. A. Coal-oil mixtures: An alternative fuel for the commercial markets and large residential markets [DE81-028335] BUTLER, B. L.
BRISCOB, J. H. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermi converter arrays p0124 A82 Jet impingement heat transfer enhancement for GPU-3 Stirling engine [NASA-TH-82727] P0140 N82 BROCKHURST, F. C. Pulsed Power Research colloquium [AD-A105770] BROCKINGTON, J. W. Catalyst and reactor development for a liquid-phase fischer-tropsch process [DE81-028209] BROWISZ, S. B. Space nuclear safety and fuels program p0111 N82 BROOME, K. R. Hodular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] BROWN, C. H., JR.	2-11168 BURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKART, J. A. Bagnetohydrodynamics (MHD) Engineering Test Pacility (ETF) 200 MWe power plant. Design Eequirements Document (DED) [NASA-TH-82705] BURNET, G. Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] p0022 N82-131 BURNS, C. C. Effects of atmospheric variability on energy utilization and conservation [DE81-026308] BUSHAIMA, A. A. Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification p0127 A82-121 BUTCHER, T. A. 2-12921 Commercial markets and large residential markets [DE81-028335] BUTLER, B. L. Introduction to solar materials science
BRISCOB, J. S. Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermiconverter arrays p0124 A82 Jet impingement heat transfer enhancement for GPU-3 Stirling engine [NASA-TH-82727] PUSE POCKHUEST, F. C. Pulsed Power Research colloquium [AD-A105770] BROCKINGTON, J. W. Catalyst and reactor development for a liquid-phase fischer-tropsch process [DE81-028209] BROWISZ, S. B. Space nuclear safety and fuels program p0111 N82 BROOME, K. R. Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] BROWN, C. H., JR. Control of hydrocarbons and carbon monoxide vicatalytic incineration [DE82-000508] p0025 N82	Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Facility (ETF) 200 MMe power plant. Design Requirements Document (DBD) [NASA-TM-82705] BURNET, G. 2-11820 Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] 2-11993 BUBNS, C. C. Effects of atmospheric variability on energy utilization and conservation [DE81-026308] BUSNAINA, A. A. Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification p0127 A82-121 BUTCHER, T. A. Coal-oil mixtures: An alternative fuel for the commercial markets and large residential markets [DE81-02835] BUTLER, B. L. Introduction to solar materials science p0037 A82-100 BUTLER, M. A. The optimization of solar conversion devices p0039 A82-100
BRISCOB, J. S. Regenerative pyroelectric heat engine Regenerative pyroelectric heat engine p0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermiconverter arrays p0124 A82 Jet impingement heat transfer enhancement for GPU-3 Stirling engine [NASA-TH-82727] BROCKHUEST, F. C. Pulsed Power Research colloquium [AD-A105770] BROCKINGTON, J. W. Catalyst and reactor development for a liquid-phase fischer-tropsch process [DE81-028209] BRONISZ, S. B. Space nuclear safety and fuels program p0111 N82 BROOME, K. R. Modular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] BROWH, C. H., JR. Control of hydrocarbons and carbon monoxide vicatalytic incineration [DB82-000508] BROWH, K. W. Geothermal environmental assessment: Behavior	DURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps [DE81-024086] BURKHART, J. A. Magnetohydrodynamics (MHD) Engineering Test Facility (ETF) 200 NWe power plant. Design Requirements Document (DED) [NASA-TB-82705] BURNET, G. Power-plant fly-ash utilization: A chemical-processing perspective [DE81-025452] POURS, C. C. Effects of atmospheric variability on energy utilization and conservation [DE81-026308] BUSHAINA, A. A. Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification P0127 A82-121 BUTCHER, T. A. Coal-oil mixtures: An alternative fuel for the commercial markets and large residential markets [DE81-028335] BUTLER, B. L. Introduction to solar materials science p0037 A82-100 BUTLER, M. A. The optimization of solar conversion devices p0039 A82-100 BUTLER, M. G. Application of large and small wind turbine
BRISCOB, J. S. Regenerative pyroelectric heat engine P0126 A82 BRITT, B. J. High temperature cogeneration with thermionic hurners p0124 A82 The design of series-parallel connected thermic converter arrays p0124 A82 Jet impingement heat transfer enhancement for GPU-3 Stirling engine [NASA-TH-82727] PROCKHURST, F. C. Pulsed Power Research colloquium [AD-A105770] PROCKINGTON, J. W. Catalyst and reactor development for a liquid-phase fischer-tropsch process [DE81-028209] PROMISZ, S. B. Space nuclear safety and fuels program P0111 N82 BROOME, K. R. Hodular hydro dam approach to the economic development of ultra low-head hydropower [DE81-027817] BROWE, C. B., JR. Control of hydrocarbons and carbon monoxide vi catalytic incineration [DE82-000508] BROWE, K. W.	DURKE, J. C. Assessment of I.C. engines as drivers for heat actuated heat pumps (DE81-024086) BURKHART, J. A. Hagnetohydrodynamics (MHD) Engineering Test Pacility (ETF) 200 NWe power plant. Design Requirements Document (DED) (NASA-TH-82705) BURNEY, G. Power-plant fly-ash utilization: A chemical-processing perspective (DE81-025452) 2-11820 Power-plant fly-ash utilization: A chemical-processing perspective (DE81-025452) 2-11993 BURNS, C. C. Effects of atmospheric variability on energy utilization and conservation (DE81-026308) BUSNAINA, A. A. Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification p0127 A82-121 BUTCHER, T. A. Coal-oil mixtures: An alternative fuel for the commercial markets and large residential markets (DE81-028335) BUTLER, B. L. Introduction to solar materials science p0037 A82-100 BUTLER, M. A. The optimization of solar conversion devices p0039 A82-100 BUTLER, B. G. Application of large and small wind turbine generators - A utility perspective

BYKOWSKI, B. B.		
Characterization of diesel emission	ns as a 1	unction
of fuel variables	n0118	N82-15233
[2007 244040]	PULIC	
С		
CABBAL, J. A.		
Study of gelled LNG		
[DE81-023259] CADOPF, L. H.	p0095	N82-10269
Status report on MHD generator mate	erials	
•		A82-11854
CAHEN, D. Photoacoustic figure of merit for p	rhototho:	-mal
energy conversion efficiency	photocne:	Mat
		A82-10192
Photoelectrochemical cells using po	clycrysta	lline
and thin film MoS2 electrodes	p0057	A82-16053
CAHR, L. S.	-	
INEL goethermal environmental progr [DE81-025671]		N82-10591
CAIRELLI, J. B.	Poooo	MOZ- 10351
Test results and facility descript:	on for a	1
40-kilowatt stirling engine	501#1	N82-13013
[NASA-TM-82620] CAIRNS, R. J.	P0141	MOZ- 130 13
Rechargeable molten-salt ceils		
[DE81-027091] CALABRESE, S. J.	p0158	N82-11595
Method of determining the creep cha	aracteria	stics of
Composite materials		
CALDURLL, L.	p0154	A82-11779
Selectivity in Pischer-Tropsch Synt	thesis:	Review
and recommendations for further a	uork	
[PB81-223596] CALLAWAY, S.	p0095	N82-,10271
Relational methodology for integrat	ting and	
analyzing field test and research		
describing enhanced oil recovery	50110	NO2_1EE00
[DE81-030441] CAMARCA, M.	porto	N82-15508
A simplified model of the thermohye	draulic	
benaviour of a linear collector r		or the
Conversion of the solar energy	network i	or the A82-18816
CONVERSION of the solar energy	p0062	A82-18816
Conversion of the solar energy CANILLI, P. A. Geologic considerations in undergro	p0062	A82-18816
Conversion of the solar energy CAMILLI, F. A. Geologic considerations in undergro system design [NASA-CE-164961]	p0062	A82-18816
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergro system design [NASA-CR-164961] CAMPBRIL, T.	p0062 pund coal	A82-18816 mining N82-11516
Conversion of the solar energy CAHILLI, P. A. Geologic considerations in undergro system design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-conse	p0062 pund coal	A82-18816 mining N82-11516
CONVERSION OF the solar energy CAMILLI, F. A. Geologic considerations in undergrounce system design [NASA-CR-164961] CAMPBRIL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854]	p0062 pund coal p0104 rving url	A82-18816 mining N82-11516
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergromystem design [NASA-CR-164961] CAMPBRIL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPON, I.	p0062 pund coal p0104 rving url	A82-18816 mining N82-11516 panism N82-11995
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergroms, system design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-conserting third World cities [DE81-029854] CAMPOX, L. Guidebook for solar process-neat ag	p0062 pund coal p0104 rving url p0016 pplicatio	A82-18816 mining N82-11516 canism N82-11995
CONVERSION OF the solar energy CAMILLI, F. A. Geologic considerations in undergrously system design [NASA-CR-164961] CAMPBRIL, T. Urban ecosystem and resource-consert in Third World cities [DE81-029854] CAMPOY, I. Guidebook for solar process-neat apple 1027977] CAPOZZI, T. J.	p0062 pund coal p0104 rving url p0016 pplicatio	A82-18816 mining N82-11516 Panism N82-11995 N82-12598
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPOV, L. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of steam	p0062 p0062 p0104 rving url p0016 pplicatio p0072	A82-18816 mining N82-11516 Panism N82-11995 DNS N82-12598
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent of the solar processing the solar processing the solar processing [DE81-027977] CAMPOX, L. Guidebook for solar processing [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applications.	p0062 p0062 p0104 rving url p0016 pplication p0072	A82-18816 mining N82-11516 canism N82-11995 Ons N82-12598
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergree system design [NASA-CR-164961] CAMPERIL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPON, L. Guidebook for solar process-neat and [DE81-027977] CAPOZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, R. W.	p0062 p0062 p0104 rving url p0016 pplicatic p0072 m/water stion p0042	A82-18816 mining N82-11516 Panism N82-11995 DNS N82-12598
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRIL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPON, I. Guidebook for solar process-neat and [DE81-02777] CAPOZZI, T. J. The development and design of steam receivers for commercial applications [ASME PAPER 81-SOL-4] CARLING, B. W. Solar-central-receiver fuels and cities [Solar-central-receivers for cultivations of the solar-central-receiver fuels and cities [Solar-central-receiver fuels and cities [Solar-central-receiver fuels and cities [Solar-central-receiver fuels and cities [Solar-central-receiver]	p0062 p0062 p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals	A82-18816 mining N82-11516 panism N82-11995 PASS-12598 Solar A82-10972
CONVERSION OF the solar energy CAMILLI, F. A. Geologic considerations in undergree system design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consert in Third World cities [DE81-029854] CAMPOY, L. Guidebook for solar process-neat application of the state of the solar process of the solar receivers for commercial application of the solar paper 81-SOL-4] CARLING, R. W. Solar-central-receiver fuels and cities of the solar central-receiver fuels and cities of the solar central c	p0062 p0062 p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals	A82-18816 mining N82-11516 canism N82-11995 Ons N82-12598
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRIL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPON, I. Guidebook for solar process-neat and [DE81-02777] CAPOZZI, T. J. The development and design of steam receivers for commercial applications [ASME PAPER 81-SOL-4] CARLING, B. W. Solar-central-receiver fuels and cities [Solar-central-receivers for cultivations of the solar-central-receiver fuels and cities [Solar-central-receiver fuels and cities [Solar-central-receiver fuels and cities [Solar-central-receiver fuels and cities [Solar-central-receiver]	p0062 p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077	A82-18816 mining N82-11516 canism N82-11995 Ons N82-12598 colar A82-10972 N82-13530
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPOV, L. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, R. H. Solar-central-receiver fuels and clean control of the control of th	p0062 p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077	A82-18816 mining N82-11516 panism N82-11995 PASS-12598 Solar A82-10972
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergree system design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consert in Third World cities [DE81-029854] CAMPOY, L. Guidebook for solar process-neat application of the state of the solar process of the solar receivers for commercial application of the solar paper 81-SOL-4] CARLING, R. W. Solar-central-receiver fuels and classing the solar-central-receiver fuels and classing for the solar-ce	p0062 pund coal p0104 rving url p0016 pplicatio p0072 m/water stion p0042 hemicals p0077	A82-18816 I mining N82-11516 Danism N82-11995 DNS N82-12598 SOlar A82-10972 N82-13530
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergree system design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPOZ, L. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, B. W. Solar-central-receiver fuels and classing the second consensus of the conse	p0062 p0104 rwing url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077	A82-18816 mining N82-11516 canism N82-11995 Ons N82-12598 Golar A82-10972 N82-13530 N82-13556
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPOY, L. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, B. W. Solar-central-receiver fuels and clips [DE82-000941] CARLISE, R. L. The Resonant Cavity Radiator (RCR) CARLSON, A. W. Mid oxidant intermediate temperature heater study [NASA-CR-165453]	p0062 p0104 rwing url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077	A82-18816 I mining N82-11516 Danism N82-11995 DNS N82-12598 SOlar A82-10972 N82-13530
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPOY, L. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, B. W. Solar-central-receiver fuels and clips [DE82-000941] CARLISE, R. L. The Resonant Cavity Radiator (RCR) CARLSON, A. W. Mid oxidant intermediate temperature heater study [NASA-CR-165453]	p0062 pund coal p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077 p0148 re cerami	A82-18816 mining N82-11516 panism N82-11995 PROPERTY OF THE PROPERTY OF T
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergrous system design [NASA-CR-164961] CAMPBRIL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPON, I. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, B. W. Solar-central-receiver fuels and classed [DE82-000941] CARLISE, B. L. The Resonant Cavity Radiator (RCR) CARLSON, A. W. MHD oxidant intermediate temperatural heater study [NASA-CR-165453] CARLSON, D. E. Amorphous boron-silicon-hydrogen and thin-film heterojunction solar careful and the solar canonical solar s	p0062 p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077 p0148 re cerami	A82-18816 mining N82-11516 panism N82-11995 PROPERTY OF THE PROPERTY OF T
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPOX, L. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicated [ASME PAPER 81-SOL-4] CARLING, B. W. Solar-central-receiver fuels and classing beam control of the paper of the pap	p0062 pund coal p0104 rving url p0016 pplication p0042 hemicals p0077 p0148 re cerami p0144 lloys for	A82-18816 I mining N82-11516 Panism N82-11995 N82-12598 R82-12598 R82-13530 N82-13556 R82-15557
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergrous system design [NASA-CR-164961] CAMPBRIL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPON, I. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, B. W. Solar-central-receiver fuels and classed [DE82-000941] CARLISE, B. L. The Resonant Cavity Radiator (RCR) CARLSON, A. W. MHD oxidant intermediate temperatural heater study [NASA-CR-165453] CARLSON, D. E. Amorphous boron-silicon-hydrogen and thin-film heterojunction solar careful and the solar canonical solar s	p0062 pund coal p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077 p0148 re cerami p0144 lloys forells p0068 lloys forells	A82-18816 I mining N82-11516 Panism N82-11995 N82-12598 R82-12598 R82-13530 N82-13556 R82-15557
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPON, I. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of stems receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, R. W. Solar-central-receiver fuels and classes, R. L. The Resonant Cavity Radiator (RCR) CARLSON, A. W. MHD oxidant intermediate temperatury heater study [NASA-CR-165453] CARLSON, D. R. Amorphous boron-silicon-hydrogen and thin-film heterojunction solar cathin-film heterojun	p0062 pund coal p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077 p0148 re cerami p0144 tloys forells p0068 lloys forells	A82-18816 I mining N82-11516 Panism N82-11995 N82-12598 R82-12598 R82-13530 N82-13556 R82-15557
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergromsystem design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPOX, L. Guidebook for solar process-neat and [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicated [ASME PAPER 81-SOL-4] CARLING, B. W. Solar-central-receiver fuels and continues of the con	p0062 pund coal p0104 rving url p0016 pplication p0042 hemicals p0077 p0148 re cerami p0144 tloys for	A82-18816 I mining N82-11516 Danism N82-11995 DAS N82-12598 Solar A82-10972 N82-13530 N82-12556 C N82-15527 : N82-11557
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergree system design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consent in Third World cities [DE81-029854] CAMPON, I. Guidebook for solar process-neat applicate [ASME PAPER 81-SOL-4] CAPOZZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, R. W. Solar-central-receiver fuels and clean control [DE82-000941] CARLISE, R. L. The Resonant Cavity Radiator (RCR) CARLSON, A. W. MHD oxidant intermediate temperature heater study [NASA-CR-165453] CARLSON, D. R. Amorphous boron-silicon-hydrogen all thin-film heterojunction solar capped [DE81-027254] Amorphous boron-silicon-hydrogen all thin-film heterojunction solar capped [DE81-027254]	p0062 pund coal p0104 rving url p0016 pplication p0072 m/water stion p0042 hemicals p0077 p0148 re cerami p0144 tloys for ells p0068 lloys for	A82-18816 I mining N82-11516 Danism N82-11995 DAS N82-12598 Solar A82-10972 N82-13530 N82-12556 C N82-15527 : N82-11557
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergree system design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consert in Third World cities [DE81-029854] CAMPON, I. Guidebook for solar process-neat applicate [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, R. H. Solar-central-receiver fuels and clean [DE82-000941] CARLISE, R. L. The Resonant Cavity Radiator (RCR) CARLSON, A. W. MHD oxidant intermediate temperature heater study [NASA-CR-165453] CARLSON, D. E. Amorphous boron-silicon-hydrogen and thin-film heterojunction solar capped [DE81-027234] Amorphous boron-silicon-hydrogen and thin-film heterojunction solar capped [DE81-027254] CARLSON, E. G. US energy strategies: Some options eliminating cil imports by the year	p0062 p0062 pund coal p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077 p0148 re cerami p0144 lloys for ells p0068 loys for ear 2000	A82-18816 I mining N82-11516 Danism N82-11995 DAS N82-12598 Solar A82-10972 N82-13530 N82-12556 C N82-15527 : N82-11557
CONVERSION OF the solar energy CAMILLI, P. A. Geologic considerations in undergree system design [NASA-CR-164961] CAMPERIL, T. Urban ecosystem and resource-consert in Third World cities [DE81-029854] CAMPON, L. Guidebook for solar process-neat application of steam receivers for commercial application for the development and design of steam receivers for commercial application family paper 81-SOL-4] CARLING, R. W. Solar-central-receiver fuels and clip (DE82-000941) CARLISE, R. L. The Resonant Cavity Radiator (RCR) CARLSON, A. W. Middon's intermediate temperature heater study [NASA-CR-165453] CARLSON, D. R. Amorphous boron-silicon-hydrogen althin-film heterojunction solar capped the	p0062 pund coal p0104 rving url p0016 pplicatic p0072 m/water stion p0042 hemicals p0077 p0148 re cerami p0144 lloys for ells p0068 s for ear 2000 p0014	A82-18816 mining N82-11516 panism N82-11995 DS Solar A82-10972 N82-13530 N82-12556 CC N82-15527 : N82-11557 : N82-11558
CONVERSION OF the solar energy CANILLI, P. A. Geologic considerations in undergree system design [NASA-CR-164961] CAMPBRLL, T. Urban ecosystem and resource-consert in Third World cities [DE81-029854] CAMPON, I. Guidebook for solar process-neat applicate [DE81-027977] CAPOZZI, T. J. The development and design of steam receivers for commercial applicate [ASME PAPER 81-SOL-4] CARLING, R. H. Solar-central-receiver fuels and clean [DE82-000941] CARLISE, R. L. The Resonant Cavity Radiator (RCR) CARLSON, A. W. MHD oxidant intermediate temperature heater study [NASA-CR-165453] CARLSON, D. E. Amorphous boron-silicon-hydrogen and thin-film heterojunction solar capped [DE81-027234] Amorphous boron-silicon-hydrogen and thin-film heterojunction solar capped [DE81-027254] CARLSON, E. G. US energy strategies: Some options eliminating cil imports by the years [PB81-226052]	p0062 p0062 pund coal p0104 rving url p0016 pplication p0072 m/water stion p0042 hemicals p0077 p0148 re cerami p0144 tloys for ells p0068 sfor ear 2000 p0014 a survey:	A82-18816 mining N82-11516 Danism N82-11995 DAS N82-12598 Solar A82-10972 N82-13530 N82-12556 C N82-15527 N82-11557 N82-11558

```
CAROTHERS, R. G.
   An analytic model of high solidity vertical axis
      windmills
                                              p0131 A82-14360
CARPBUTER, B.
   Chemical and geochemical studies off the coast of
      Washington
      [DE81-030319]
                                              p0017 N82-12513
CARPETIS, C.
   The storage of hydrogen
                                              p0085 A82-17130
   Hydrogen as carrier of secondary energy: Proposal
     for a research and development program
                                              p0087 N82-15542
      [DFVLR-HITT-81-10]
CARROLL, D. P.
Security assessment of power systems including energy storage and with the integration of wind
      energy
      [DE81-030166]
                                               p0140 N82-12590
CARROLL, W.
   Verification of BLAST by comparison with measurements of a solar-dominated test cell and a thermally massive building
     [DE81-029883]
                                              p0082 N82-15578
CARTY, R. H.
   Parametric study of the cadmium
      thermoelectrochemical hydrogen cycle
                                              p0083 A82-11785
CASENAVE. D.
   A study of the purification process during the
      elaboration by electron bombardment of
      polysilicon ribbons designed for photovoltaic
      conversion
                                              p0057 A82-16054
CASKRY, B. C.
   Sandia program in geothermal technology development [DE81-025394] p0119 N82-1554
                                              p0119 N82-15546
   Bibliography of the seasonal thermal energy
     storage library [DE81-030470]
                                               p0159 N82-12586
CASSINELLI, J.
   High power solar array switching regulation
                                              p0045 A82-11736
   Numerical simulation of solar cell open circuit
      voltage decay
                                              p0041 A82-10658
   Investigations of the OCVD transients in solar cells
                                              p0043 A82-11334
CATAN, M. A.
   Solar heat pump simulator [DE81-024368]
                                              p0070 N82-11583
CECCHERINI, C.
   Theoretical analysis of the performance of a
      gravity-controlled solar concentrator
                                              p0050 A82-12812
CERMASOV, A.
   Thermoelectric conversions based on noise
      rectification
                                               p0138 N82-10936
CHACOUR, S. A.
   Design considerations for a 1500 M head 300-600 MW double stage reversible pump/turbine with
      regulation
   Multijunction high voltage concentrator solar cells
                                              p0047 A82-11796
CHAIT, I. L.
MHD oxidant intermediate temperature ceramic
     heater study
     [ NASA-CR-165453 ]
                                              p0144 N82-15527
CHAMPNESS, C. H.
   Investigations on a Se-CdO photovoltaic cell
                                              p0132 A82-16052
CHAH, G. L.
   Proposed 10 NWe OTEC pilot plant for the
     Commonwealth of the Northern Mariana Islands [AIAA FAPER 81-2561] p0128 A82
                                              p0128 A82-14020
CHAN,
   Incorporation and impact of a wind energy conversion system in generation expansion planning
                                              P0004 A82-15068
   Three-dimensional, finite elemental model for
     simulating heavier-than-air gaseous releases
      over variable terrain
     [DE81-028689]
                                              p0032 N82-15602
```

CELEBRA CRITERA D		CORP C D	
CHANDRASEHRAR, R. Conceptual design of 500 to 3000 hp Stirling		CHRW, C. B. Controlled-flash pyrolysis	
engines for stationary power generation		[DE82-000284]	p0111 N82-13196
	82-11807	CHEN, H. H.	•
CHANG, C. S.		Planning an underground pumped hydro	project for
Measurement of thermal conductivities in coa	11 11010S 182-12400	the Commonwealth Edison Company	-04E# 102-110#7
[DE82-000523] p0109 N CHANG, G. C.		CHERRY, K.	p0154 A82-11847
Design considerations for small wind energy		V205-Si photovoltaic cells	
conversion and storage systems		• • • • • • • • • • • • • • • • • • • •	p0051 A82-12824
	182-11831	CHIANG, S. H.	
CHANG, R. L. S.	4	Water and energy usage in coal prepar	
Development of a high-temperature durable ca for use in catalytic combustors for advance		[PB81-238248] CHIAO, T. T.	p0112 N82-13486
automotive gas turbine engines	,eu	Mechanical energy storage technology	project
	182-13510	[DE81-029753]	p0155 N82-10508
CHANG, S. G.		CHIB, C. H.	•
Kinetics of reactions in a wet flue gas		Performance analysis and simulation	of the SPS
simultaneous desulfurization and denitrifi	cation	 reference phase control system 	
system [DE81-029853] p0033 B	182-15607	Coherent multiple tone technique for	p0071 #82-12544
CHANG, W.	102 13001	SPS phase control	ground based
Development of a thermodynamic properties		DED FREE CONTOUR	p0147 N82-12546
correlation framework for the coal convers	510D	CHIGHR, H. D.	•
industry, phase 1A		The GA sulfur-iodine water-splitting	process - A
[DE81-030363] P0111 B	182-12985	status report	
Application of a gravity-driven wickless hea	t nine	CHILEBSKES, A. A.	p0084 A82-11844
for ice production in a cold energy storage		Recent progress in lithium/iron sulf:	ide batterv
	182-13377	development	20 220027
CHAPMAN, R. A.		[DE81-023127]	p0157 N82-10557
Coal resources and sulphur emission regulati		CHING, B. K.	
A suzmary of 8 eastern and midwestern stat		Environmental factors of power satel	
[PB81-240319] p0031 N CHAPMAH, R. H.	182-15514	CHIDVA V D	p0002 A82-12505
Geophysical survey, Paso Robles geothermal a	rea.	CHIRVA, V. P. Production and certain properties of	photoelectric
California, part of the resource assessmen		cells based on silicon epitaxial s	
low- and moderate-temperature geothermal			p0053 A82-13716
resource areas in California		CHIO, L. S.	
[DE81-026038] p0109 B Resource assessment of Low and	182-12517	Oceans and ocean currents: Their in:	tluence on
Moderate-temperature geothermal waters in		climate [DE81-027263]	p0016 N82-11731
Calistoga, Napa County, California	(CHIU, T. T.	poo 10 BOZ 11751
	182-12518	Effects of low temperature periodic	annealing on .
CHARLES, J. P.		the deep-level defects in 200 keV	
A practical method of analysis of the		irradiated AlGaAs-GaAs solar cells	
current-voltage characteristics of solar c		CUIT V B	p0061 A82-18287
CHARLESTON, J.	102 12025	CHIU, Y. T. Environmental factors of power satel:	lites
Performance of advanced chromium electrodes	for		p0002 A82-12505
the NASA Redox Energy Storage System		CHO, S. M.	_
	82-12574	Boiling flow instability of a fixed i	iffor
CHARLIER, R. H. Waves of energy		distributed focus solar receiver	p0041 A82-10810
	.82-10450	CHOCKIE, A.	P0041 R02-10010
Turbines in the ocean		Biomass energy utilization in the Pac	cific
	.82-16844	Northwest: Impacts associated with	
CHARNG, T.		use of solid fuels	
Assessment of advanced coal gasification pro		[DB81-029137]	p0115 N82-14383
[NASA-CR-164949] p0098 N CHASE, G. W.	182-11146	CHOCKIE, A. D. Technology assessment of solar energy	. evetome.
Geophysical survey, Paso Robles geothermal a	rea.	Availability and impacts of woody	
California, part of the resource assessmen		ntilization in the Pacific Northwes	
low- and moderate-temperature geothermal		[DB82-000705]	p0024 N82-13535
resource areas in California		CHOPRA, K. L.	_
[DE81-026038] p0109 N Resource assessment of Low and	82-12517	Solution grown PbS/CdS multilayer sta selective absorbers	icks as
Moderate-temperature geothernal waters in		selective absorbers	p0041 A82-10472
Calistoga, Napa County, California	(CHOPRA, P. S.	P0041 NOT 10412
	82-12518	Solar data base management system	
CHATTERJEE, H.		[DE81-023122]	p0066 N82-10952
Load-change testing of a large commercial ox	ygen (CHOU, D. J.	
plant [EPRI-NP-1824] p0096 H	82-10275	Applications of thermoelectrics to go energy conversion	cornerman
CHATTERTON, E. E.	02-10275	energy conversion	p0125 A82-11824
Investigation of direct solar-to-microwave e	nergy (CHRISTENSEE, C.	P0.120 202 (102)
conversion techniques		Comparison of residential window dist	ributions and
	82-11544	effects of mass and insulation	
CHAUHAN, S. P.		[DE81-027938]	p0017 N82-12283
Thermophysical properties of coal liquids [DE81-0279446] p0097 H	82-10938	CHRISTENSEN, L. B. Models for forecasting energy use in	the US farm
CHE, S. C.	~~ (V3-30	sector	rarm
Controlled-flash pyrolysis		[DE81-904220]	P0018 N82-12580
[DE82-000284] p0111 H	82-13196	CHRISTENSEN, B. T.	
CHEKALIN, B. K. Study of the electric conductivity of plasma		Utilization of waste heat from major	transformer
SEGUY OF THE RECETT CONGRETIVITY OF DIASMA	£		
fuel combustion products containing a weak		substations. Volume 1: Generic st [DE81-904212]	

p0091 A82-12888

CLEMENTS, L. D.

Boiling flow instability of a fixed mirror

Utilization of waste heat from major transformer substations. Volume 2: Site-specific study p0019 N82-12594 FDR81-9042361 CHRISTIANSON, C. C.
Near-term batteries for electric vehicles p0157 N82-10556 [DE81-023543] Status of nickel/zinc and nickel/iron battery technology for electric vehicle aprlications [DE81-023572] p0157 N82 D0157 N82-10962 CHU, B. K.
Kinetics of NO/ sub x formation during early stages of pulverized-coal combustion [DE81-029071] p0014 N82-11641 Development of a high-temperature durable catalyst for use in catalytic ccmbustors for advanced automotive gas turbine engines
[NASA-CR-165396] p0142 N82p0142 N82-13510 CHU, S. S. Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 CHU, T. L. Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 Effects of heat treatment on epitazial silicon solar cells on metallurgical silicon substrates D0058 A82-16469 An experimental study of SO3 dissociation as a mechanism for converting and transporting solar energy p0043 A82-11214 CHUGUNKOV, V. V.
Method for calculating the unsteady temperature conditions of the generator in a sclar refrigeration system D0056 A82-15642 Vertical combustor for refuse combustion [DE81-030002] p0098 N82-11152 CHVOIRA, M. Ionization waves in an argon discharge in a longitudinal gas flow p0127 A82-12666 Influence of the junction area to edge area ratio on the open-circuit voltage of silicon solar cells CINGO, R. P.
SWECS technology - State-of-the-art and achievable goals p0134 A82-17644 CIOBI, J. L. Solar cell development for the Power Extension Package p0046 A82-11763 Solar cell development for the power extension package [NASA-TM-82685] CLAASSEB, R. S. Introduction to solar materials science p0037 A82-10008 CLAESSON, J. Study of ATES thermal behavior using a steady flow [DE81-030883] p0159 N82-12396 CLARIDGE, D. R.
Performance analysis of 11 Denver Metro passive homes [DE81-025473] p0074 N82-12626 CLARK, W. Assessment of pulverized-coal-fired combustor performance DE61-030860] p0105 N82-12187 CLAVERIE, M. J.
Market potential and problems for SSPS p0050 A82-12502 Coal gasifier parameters influencing environmental pollutant production [PB81-221301] p0011 N82-112 p0011 N82-11273 Environmental hazard rankings of pollutants generated in coal gasification processes [PB81-231698] p0026 N82-13576 CLEMENTE, B. A. The tilting mode in field-reversed configurations

p0121 A82-11131

distributed focus solar receiver p0041 A82-10810 CLEMENTS. B. LLNL underground coal gasification project p0103 N82-11267 [DE81-030634] CLOWINGER, M. O.

Comparison of potential radiological consequences natural-uranium deposits [DE81-028232] p0029 N82-14910 COBB, H. R. W. Standards application and development plan for solar thermal technologies [DE81-030310] p0065 ·N82-10534 COBBLE, H. H. A spacecraft thermophotovoltaic power source with thermal storage n0044 A82-11711 COCHRANE, H. Effects of atmospheric variability on energy utilization and conservation [DE81-026308] p0008 N82-10592 COCKPIBLD, R. D. Engineering development testing of the GPHS-RTG converter p0122 A82-11752 COBBN. D. Liquid-metal MHD for solar and coal [DE81-023545] D0137 N82-10553 COREN, E.
Yaw dynamics of a horizontal axis wind turbine
p0133 A82 p0133 A82-17637 COHENDET, P. Economic effects induced by ESA contracts, phase 2. Volume 1: Summary [ESA-CE(P)-1462-VOL-1] D0161 N82-14981 COLBOW, K. Current-voltage characteristics of semiconductor-electrolyte junction solar cells p0055 A82-15112 The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 Luminescent solar concentrators. II - Experimental and theoretical analysis of their possible efficiencies p0052 A82-13285 COLEMAN, G. C.
Testing of the U.S. Solar Pilot Plant receiver
[ASME PAPER 81-SOL-3] p0041 A82p0041 A82-10971 COLVILLE, G. Bnergy end-use requirements in manufacturing, Valume 1 [DB81-028975] p0064 N82-10512 Energy end-use requirements in manufacturing, volume 3 [DB81-027976] D0007 N82-10544 CONGDON, C. W. Jet implugement heat transfer enhancement for the GPU-3 Stirling engine [NASA-TH-82727] D0140 N82-11993 COMLEY. B. Variable speed wind turbine control system p0127 A82-11859 CONTI, M.
A simplified model of the thermohydraulic behaviour of a linear collector network for the conversion of the solar energy p0062 A82-18816 COOK, R. L. Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] D0135 A82-17913 COOPER, P. I. The effect of inclination on the heat loss from flat-plate solar collectors p0043 A82-11212 COPB. A. B. G. Simple tracking strategies for solar concentrations D0042 A82-11207 Ground-mounted thermal storage for the parabolic dish solar collector/Stirling engine system p0047 A82-11781

Systems analysis of thermal storage [DB81-030288] p0079 M82-14658	The all electric airplane - Its development and logistic support
CORBETT, R. E. Series vs. shunt regulators for power control in	p0004 A82-14709 The all-electric airplane - A new trend
satellite power systems	p0006 A82-17420
P0045 A82-11738	CROTHERS, W. T. Mechanical energy storage technology project
Liquid natural gas rapid phase transitions [PB81-244774] p0118 H82-15232	[DB81-029753] p0155 N82-10508 CUBLLO, R.
CORCORAN, E. E. Supercritical multicomponent solvent coal extraction	Transportation fuels from synthetic gas [DE81-029614] p0102 N82-11258
[NASA-CASE-NPO-15767-1] p0107 N82-12241 CORMAN, J. C.	CUEVAS, A. Influence of the junction area to edge area ratio
Experimental evaluation of the steady-state and dynamic performance characteristics of the	on the open-circuit voltage of silicon solar cells p0058 A82-16133
interactive units of a coal-gasification process [DE81-028995] p0094 B82-10259 CORNELIUS, D. K.	CULLINGFORD, H. S. Bydrogen storage-bed design for tritium systems test assembly
Computational tools for pulverized-coal combustion	[DE81-025336] p0086 N82-11262
[DE81-028582] p0098 B82-11148 CORTEX, D. H.	CULTER, H. H. Tennessee Valley Authority atmospheric
Production of synthetic crude oil from coal using the TOSCOAL pyrolysis process	fluidized-bed combustor simulation [DB81-030262] p0098 N82-11151
p0090 182-11849 COURVILLE, G. R.	CUMMINGS, R. B. Status report on Central Maine Power Company's DOE
Assessment of building diagnostics [DE81-027078] p0012 N82-11321	Funded feasibility study of the Sears Island integrated gasification combined cycle power plant
COX, 1. Heavy-duty engine baseline program and NO sub x	p0089 A82-11835
emission standard development (1972-73)	Longwall mining of thin seams
CRAIG, S.	[DE81-028042] p0116 N82-14612 CURTICE, D.
Effect of metal base layer on the absorptance and emittance of sputtered graded metal-carbon	Operations of small wind turbines on a distribution system
selective absorbing surfaces	p0 133 A82-17633 CURTIS, R. B.
CRAIGHBAD, H. G. Composite film selective-absorbers	Theoretical basis of the DOE-2 building energy use analysis program
p0038 A82-10016 CRANDALL, B. S.	[DE81-028896] p0030 N82-15242 CUTTING, J. C.
Stability of n-i-p amorphous silicon solar cells	Assessment of MHD power plants with coal
p0043 A82-11343 A comparison of p-i-n and Schottky barrier	gasification [AIAA PAPER 81-2574] p0129 A82-14030
hydrogenated amorphous silicon, a-Si:H, solar	CZAHDRRHA, A. W.
cells	Surface and interface studies and the stability of
p0060 A82-17649 Pield nonuniformity due to photogenerated carriers	solid solar energy materials p0037 A82-10010
p0060 A82-17649	solid solar energy materials p0037 182-10010
p0060 A82-17649 Field nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRAMFORD, A. R.	solid solar energy materials p0037 182-10010
p0060 A82-17649 Field nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRAWFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification,	solid solar energy materials p0037 182-10010 D DACIERNO, J. Systems analysis of hydrogen/natural gas
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] p0015 M82-11654	solid solar energy materials p0037 182-10010 D DACIEBNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 182-15220
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTOB, J. R. Hathematical modelling of some chemical and	solid solar energy materials D DACIEBNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] DALESSIO, G. Wear-term goals for alcohol fuels from biomass:
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRANFORD, A. B. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTOF, J. R. Mathematical modelling of some chemical and physical processes in underground coal gasification	p0037 A82-10010 D DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 N82-15220 DALESSIO, G. Near-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTON, J. R. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] p0116 N82-14613	DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 N82-15220 DALESSIO, G. Near-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] p0010 N82-11245
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRANFORD, A. B. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTON, J. B. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB):	DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 N82-15220 DALESSIO, G. Hear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] p0010 N82-11245 DALZIEL, B. C. Biogeochemical evidence for subsurface hydrocarbon
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTON, J. R. Hathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CREITCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for	DACIEBNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] DALESSIO, G. Near-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] DALZIEL, H. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: preliminary results
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRANFORD, A. B. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTOB, J. R. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] p0017 N82-12278	DALIERHO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 N82-15220 DALESSIO, G. Hear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] p0010 N82-11245 DALIEL, H. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Freliminary results [USGS-CIRC-837] p0110 N82-12693 DAMPIER, P. W.
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell P0060 A82-17650 CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTON, J. R. Hathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Requirements definition and impact analysis-2.	DACIERHO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 N82-15220 DALESSIO, G. Wear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] p0010 N82-11245 DALZIEL, M. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Freliminary results [USGS-CIRC-837] p0110 N82-12693 DAMPIER, F. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRANFORD, A. B. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTOB, J. R. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] p0017 N82-12278 Solar Heating And Cooling Of Buildings (SHACOB):	DALIER No. 2-10010 DACIER NO. 3- Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] DALESSIO. 6- Near-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] DALIEL, N. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DAMPIER, F. W. Insoluble sulfide positive electrodes for organic
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell P0060 A82-17650 CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTON, J. R. Hathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB):	DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] DALESSIO, G. Near-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] DALZIEL, H. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: preliminary results [USGS-CIRC-837] DAMPIER, P. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, B. B. Controlled cadmium telluride than films for
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRAWFORD, A. B. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTOB, J. R. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Comestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems	DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] DALESSIO, G. Wear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] DALZIEL, H. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Freliminary results [USGS-CIRC-837] DAMPIER, F. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, M. B. Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell P0060 A82-17650 CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTON, J. R. Hathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] CROMACK, D.	DACIERHO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 N82-15220 DALESSIO, G. Wear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] p0010 N82-11245 DALZIEL, M. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Freliminary results [USGS-CIRC-837] p0110 N82-12693 DAMPIER, F. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, M. B. Controlled cadmium telluride thin films for solar-cell applications (DE81-023275) p0066 N82-10569 DAUBACH, B. O. Optical diagnostic techniques for coal-fired MBD
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRAWFORD, A. B. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTOB, J. B. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Comestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] CROMACK, D. Methodology for the evaluation of aerodynamic performance and rotor optimization under	D DACIERHO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] DALESSIO, G. Hear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] DALZIEL, H. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DAMPIER, P. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, M. B. Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] DAUBACH, B. O. Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell P0060 A82-17650 CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTOB, J. R. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] CROMACK, D. Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] P00128 A82-14019	DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 N82-15220 DALESSIO, G. Wear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] p0010 N82-11245 DALZIEL, M. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Freliminary results [USGS-CIRC-837] p0110 N82-12693 DAMPIER, F. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, B. B. Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 DAUBACH, B. O. Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913 DAUBERT, E. B. Control system development for a 1 MW/e/ solar
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell P0060 A82-17650 CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTON, J. R. Hathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] CROHACK, D. Hethodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation	DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] DALESSIO, G. Wear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] DALIEL, H. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: preliminary results [USGS-CIRC-837] DAMPIER, P. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, B. B. Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] DAUBACH, B. O. Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] DAUBERT, B. B. Control system development for a 1 MW/e/ solar thermal power plant
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell P0060 A82-17650 CRANFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTON, J. R. Hathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] CROMACK, D. Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] Yaw dynamics of a horizontal axis wind turbine p0133 A82-17637 Wind driven fluid devices for water heating	DACIERHO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 N82-15220 DALESSIO, G. Near-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] p0010 N82-11245 DALZIBL, M. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Freliminary results [USGS-CIRC-837] p0110 N82-12693 DAMPIER, F. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, M. B. Controlled cadmium telluride thin films for solar-cell applications (DE81-023275) p0066 N82-10569 DAUBACH, B. O. Optical diagnostic techniques for coal-fired MHD applications (AIAA PAPER 82-0377) p0135 A82-17913 DAUBERT, E. R. Control system development for a 1 MW/e/ solar thermal power plant p0048 A82-11801
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell P0060 A82-17650 CRAWFORD, A. B. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CREIGHTOW, J. R. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] P0071 N82-12279 Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] P0071 N82-12279 Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] P0071 N82-12280 CROMACK, D. Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] Yaw dynamics of a horizontal axis wind turbine pol 33 A82-17637 Wind driven fluid devices for water heating pol 134 A82-17639 CROMAUER, D. C.	DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] p0087 M82-15220 DALESSIO, G. Wear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] p0010 M82-11245 DALZIEL, M. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Freliminary results [USGS-CIRC-837] p0110 M82-12693 DAMPIER, F. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, M. B. Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 M82-10569 DAUBACH, R. O. Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] p0135 A82-17913 DAUBRET, R. R. Control system development for a 1 MW/e/ solar thermal power plant p0048 A82-11801 DAUGHERTY, D. P. Coal gasifier parameters influencing environmental pollutant production
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRAWFORD, A. R. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] CRRIGHTOB, J. R. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] CRRTCRER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Customer load management systems [DE82-900208] CROMACK, D. Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] p0128 A82-14019 Yaw dynamics of a horizontal axis wind turbine p0133 A82-17637 Wind driven fluid devices for water heating p0134 A82-17639 CROMAUER, D. C. Investigation of mechanisms of hydrogen transfer in coal hydrogenation	DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] DALESSIO, G. Wear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] DALIEL, H. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DAHPIER, P. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, B. B. Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] DAUBACH, B. O. Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] DAUBERT, B. R. Control system development for a 1 MW/e/ solar thermal power plant DAUGHERTY, D. P. Coal gasifier parameters influencing environmental pollutant production [FB81-221301] DAUVE, J.
Pield nonuniformity due to photogenerated carriers in a p-i-n solar cell p0060 A82-17650 CRAWFOED, A. B. Control of utility boiler and gas turbine pollutant emissions by combustion modification, phase 2 [PB81-222267] p0015 N82-11654 CRRIGHTOB, J. B. Mathematical modelling of some chemical and physical processes in underground coal gasification [DE81-027941] p0116 N82-14613 CRETCHER, C. K. Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 1: Energy-conserving design for residential structures [DE82-900206] p0017 N82-12278 Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 2: Domestic hot water systems [DE82-900207] p0071 N82-12279 Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] p0071 N82-12280 CROMACK, D. Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] p0128 A82-14019 Yaw dynamics of a horizontal axis wind turbine p0133 A82-17637 Wind driven fluid devices for water heating p0134 A82-17639 CROMAURR, D. C. Investigation of mechanisms of hydrogen transfer	DACIERNO, J. Systems analysis of hydrogen/natural gas supplementation and separation [DE81-021383] DALESSIO, G. Wear-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts [DE81-029987] DALZIEL, H. C. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: preliminary results [USGS-CIRC-837] DAMPIER, P. W. Insoluble sulfide positive electrodes for organic electrolyte lithium secondary batteries p0155 A82-15727 DAS, H. B. Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] DAUBACH, R. O. Optical diagnostic techniques for coal-fired MHD applications [AIAA PAPER 82-0377] DAUBERT, B. R. Control system development for a 1 MW/e/ solar thermal power plant P0048 A82-11801 DAUGHERTY, D. P. Coal gasifier parameters influencing environmental pollutant production [FB81-221301]

DAVIDSON, P. P. Macro-engineering: The rich potential of the Third Symposium, San Francis		
January 6, 1980	_	., A82-18643
DAVIDSOE, B. S. Microprocessor applications for the m	_	
control of gas supplies [ER\$-E-276]		N82-10735
DAVIS, B. C. Coal conversion solid waste disposal	-	
[DE81-028567] DAVIS, J. Peat resource evaluation: State of B	_	N82-14680
[DE82-000227] DAVIS, K. A.		N82-12523
The AGT101 technology - An automotive		native A82-11783
Fuel conservation now	ъ0005	A82-17281
DAVIS, R. E. Process development for improved SRC Kerr-McGee critical sclvent deashing	option	
fractionation studies [DE81-903785]	p0114	N82-14380
DAVIS, R. M. Effects of heat treatment on epitaxia	l sil:	con
solar cells on metallurgical silico		trates 182-16469
Coal and limestone feed testing for a fluidized bed combustion	tmosph	eric
[DE81-030629] DAY, J. T.	p0117	N82-15222
Electric utility modeling extensions solar plants	to eva	luate
DE BENI, G.	-	A82-18025
Thermochemical processes for hydroger by water splitting - From theory to	pract	iction :ice 1832-18392
DE GROOT, J. L. B. Photocorrosion of strontium titanate		nodes A82-16056
DE KREUK, C. W. Photocorrosion of strontium titanate		nodes A82-16056
DEAVER, P. K. Mississippi County Community College	solar	
photovoltaic project [DE81-030669]	8 300 g	N82-11554
DEBORR, P. C. T. Pyrolysis of coal-drived fuels using		
laser-powered homogeneous pyrolysis [DE82-000251] DECARLO, 9.		11gue 182-12196
Solid and hazardous energy wastes: S Review of research activities	ynfuel	.s. 1:
[DE81-028503] DECKER, D. K.	p0014	N82-11644
High power solar array switching regu	p0045	1 A82-11736
Power management of multi-hundred kil spacecraft power systems		
DECKER, E.	-	A82-11769
Hot dry rock geothermal prospects, 19 [DE81-025305]		N82-15559
DECORTE, K. H. Passive/hybrid solar components: An standard thermal test methods	approa	ich to
[PB81-227886] DRES, D. D.	p0077	N82-13549
Catalytic effect of iron in hydrogas: coal	ficati	on of
[DE81-023928] DEGNAN, J. R.	p0113	N82-14323
Design considerations for a 1500 M be double stage reversible pump/turbing regulation		
DELAROY, A. E.	p0154	A82-11782
Impurity effects in a-Si:H solar cell [DE81-025069]		N82-11575
DELALLO, M. R., JR. Assessment of MHD power plants with o	oal	
gasification [Alaa Papes 81-2574]	p0129	A82-14030

```
DELANEY, B. T.

Methodology for determining the impact of environmental regulatory programs
      [DE81-903429]
                                               p0009 N82-10594
DELLARETTI, O.
   Sulfur pollution control. Phase 1: The disposal
      program (sections 5 through 7)
[PB81-222804]
                                               p0015 N82-11655
DEMAS, P.
    Outgassing of two synthetic fuels
[AD-A104580]
DENICERLIS, P.
                                               p0100 N82-11231
   Aplanatic double reflection system for
      thermophotovoltaic applications - Design
                                              p0060 A82-17293
    Loading schemes for a 50 MW/th/ diagonally
      connected MHD generator
                                               p0135 A82-17923
      [AIAA PAPER 82-0395]
DESIGN and development of a reciprocating
      low-temperature freon expander
      [DE81-028609]
                                               p0023 N82-13392
DEMPSEY, M. D.
   Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6
                                               p0154 A82-15726
DBNEOFVILLE, J. P.
Progress in large area photovoltaic devices based
      on amorphous silicon alloys
                                               p0049 A82-11855
DENNIS, C. Problems and potential for MHD retrofit of
      existing coal-fired plants
      [AIAA PAPER 81-2586]
                                               p0130 A82-14036
DENNISON, B. W.
   Solar concentrator panel and gore testing in the JPL 25-foot space simulator
[AIAA PAPER 81-2534] p0054 A82-16
                                               p0054 A82-14005
DERICKSON, R. G.
    Flexibilities in passive design: Examining some
      limiting solar myths
      [DE81-028401]
                                              p0073 N82-12623
DEUL, M.
   Creating a safer environment in US coal mines:
      The Bureau of Mines Methane Control Program,
      1964-79
      [PB81-233918]
                                              p0112 N82-13488
DHANASEKARAN, P. C. Effect of junction depth on the performance of a
      diffused n/+/p silicon solar cell
    Theory of back surface field silicon solar cells
                                              p0056 A82-15447
DIALS, G. E.

The severity of institutional barriers affecting
      energy-from-municipal-waste technologies
      [DE82-000133]
                                              p0018 N82-12583
DIATCHUN, 2.
   Heavy-duty engine baseline program and NO sub x
      emission standard development (1972-73)
      [ PB8 1-244030 ]
                                               p0034 N82-15621
DIBLEY, H.
    Energy savings with today's technology
                                               p0005 A82-17282
DICK. R. S.
    High temperature cogeneration with thermionic
      purners
                                               p0124 A82-11817
    The design of series-parallel connected thermionic
      converter arrays
                                               p0124 A82-11820
DICKINSON. B. M.
    Rectenna array measurement results
                                              p0149 N82-12564
DIDERRICH, G. T.
   Site And Neighborhood Design (SAND): Development of simplified automated building thermal load
      procedures, phase 1 [DE81-027138]
                                               p0011 N82~11317
DIRTZHAM, W. D.

Venezuela, Trinidad and Tobago: Crude oil
potential from known deposits
      DE81-027023]
                                               p0096 N82-10474
DIPPENBACE, R. A.
    Synthesis gas conversion to liquid fuels using
      promoted fused iron catalysts
      [DE81-030857]
                                               p0108 N82-12259
```

OESYS: A simulation tool for nonconventional	DOUGHTY, C. Study of AFRS thermal behavior using a steady flow
energy applications analysis. Theoretical and	Study of ATES thermal behavior using a steady flow model
operational description with user documentation	[DE81-030883] p0159 N82-12396
[DE81-029701] p0007 N82-10514	DOUGLAS, R. B.
Cost goals for a residential photovoltaic/thermal liquid collector system set in three northern	Water and energy usage in coal preparation [PB81-238248] p0112 N82-13486
locations	DOUGLASS, D. L.
[DE81-029700] p0073 N82-12610	The corrosion of some superalloys in contact with
DIPIPPO, R. Analysis of thermal/mechanical energy-conversion	coal chars in coal gasifier atmospheres p0091 A82-17974
concepts	DOWNER, J. R.
[DE81-027854] p0139 N82-11585	Energy conservation through utilization of
DJEMAL, G. Photoclostrochomical colle noine nelverystalline	mechanical energy storage
Photoelectrochemical cells using polycrystalline and thin film MoS2 electrodes	p0002 A82-11845
. p0057 A82-16053	Thermophysical properties of coal liquids
DLOTT, E. H.	[DE81-0279446] p0097 N82-10938
Analysis of electric utility investments into wind power	DU PLOOY, D. P. Puel conservation measures in South African
[AIAA PAPER 81-2537] p0003 A82-14006	airways - A review of activity and a glimpse of
DOCHAT, G. R.	future developments
Development free-piston Stirling test-bed engine p0123 A82-11808	p0004 A82-15598
DODD, C. W.	DUB, W. Utility operating strategy and requirements for
Lightning protection for wind turbine electronics	the wind power forecast
[AIAA PAPER 81-2571] p0129 A82-14028	[AIAA PAPER 81-2539] p0127 A82-14007
DODGE, M. M. Assessment of in-place solution methane in	DUBOW, J. B. Series resistance effects in 20 sq cm indium tin
tertiary sandstones: Texas Gulf Coast	oxide-polycrystalline silicon solar cells
[DB81-029772] p0117 N82-15225	p0051 A82-12819
DOENBERG, A. Property and development in Contral America Volume	DUCAS, W.
Energy and development in Central America. Volume 2: Country assessments	Passive/bybrid solar components: An approach to standard thermal test methods
[PB81-231557] p0032 N82-15590	[PB81-227886] p0077 M82-13549
DORREBERG, A.	DUDLEY, V. B.
Energy and development in Central America. Volume 1: Regional assessment	Performance testing of the TOLTEC TI-410 concentrating solar collector
[PB81-231540] p0032 N82-15589	[DE81-029994] p0071 N82-11617
DOHERTY, T. J.	DOPP, W. S.
Reservoir stability studies [DE81-030099] p0160 N82-15510	Pocal plane flux distributions produced by solar
DOLGIERY, IU. B.	concentrating reflectors p0043 A82-11211
Effect of wick dryness on the performance of heat	DUGGER, G. L.
pipes with separate channels	Alternative ocean energy products and hybrid
	geothermal-OTEC /GEOTEC/ plants
p0005 A82-16272 DOMASZEWICZ, A. G.	
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B.
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 NWe OTEC pilot plant for the
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOMALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 NWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAH, L. H. Ionospheric power beam studies
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOMALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAN, L. H. Ionospheric power beam studies p0147 N82-12542
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P.	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAH, L. H. Ionospheric power beam studies p0147 N82-12542 DUNNING, G. J.
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOMALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect,	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAN, L. M. Ionospheric power heam studies p0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOMALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAH, L. H. Ionospheric power beam studies p0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAH, L. H. Ionospheric power beam studies p0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOMALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOMDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOMLRY, S. H.	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAH, L. H. Ionospheric power beam studies p0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOMALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAH, L. H. Ionospheric power beam studies p0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSFS
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. N. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOBOVAN, T. J.	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAN, L. M. Ionospheric power beam studies P0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Harket potential and problems for SSFS p0050 A82-12502
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOMALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, B. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOMOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming:	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariada Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAH, L. H. Ionospheric power beam studies p0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS p0050 A82-12502 DURAI-SWAMY, K. Controlled-flash pyrolysis [DE82-000284] p0111 N82-13196
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOMOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Prelimnary results	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DONALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DONDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DONLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOHOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAM, L. M. Ionospheric power beam studies P0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS DURAI-SWAMY, K. Controlled-flash pyrolysis [DE82-000284] p0111 N82-13196 DURAHD, S. The El Paso electric 20-kilowatt photovoltaic system
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOMOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Prelimnary results	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 DOWDANVILLE, B. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] p0109 N82-12516 DOWLEY, S. N. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOHOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] p0110 N82-12693 DORE, H. C. Development and application of analytical techniques to chemistry of donor solvent	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAN, L. M. Ionospheric power beam studies P0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS DURAI-SWAMY, K. Controlled-flash pyrolysis [DE82-000284] p0111 N82-13196 DURAID, S. The El Paso electric 20-kilowatt photovoltaic system [AIAA PAPER 82-0064] p0600 A82-17761 DURRAIT, O. W. The development and design of steam/water solar
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOMALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOMOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORE, E. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, B. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOWOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORE, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] p0099 N82-11166	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAN, L. M. Ionospheric power beam studies P0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS DURAI-SWAMY, K. Controlled-flash pyrolysis [DE82-000284] p0111 N82-13196 DURAID, S. The El Paso electric 20-kilowatt photovoltaic system [AIAA PAPER 82-0064] p0600 A82-17761 DURRAIT, O. W. The development and design of steam/water solar
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DONALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DONDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DONLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DONOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORN, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWE OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAM, L. M. Ionospheric power beam studies DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS DURAI-SWAMY, K. Controlled-flash pyrolysis [DER2-000284] p0111 N82-13196 DURAHD, S. The El Paso electric 20-kilowatt photovoltaic system [AIAA PAPER 82-0064] p0060 A82-17761 DURAMST, O. W. The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 DURST, I. Production of alloys of bismuth telluride for
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOMOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORE, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAN, L. M. Ionospheric power beam studies p0147 M82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS p0050 A82-12502 DURAI-SWAMY, K. Controlled-flash pyrolysis [DE82-000284] p0111 M82-13196 DURAMD, S. The El Paso electric 20-kilowatt photovoltaic system [AIAA PAPER 82-0064] p0060 A82-17761 DURAINT, O. W. The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 DURST, 1. Production of alloys of bismuth telluride for solar thermoelectric generators
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, B. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOWOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORE, B. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-02961] p0099 N82-11167	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWE OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAH, L. M. Ionospheric power beam studies p0147 N82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS p0050 A82-12502 DURAI-SWAMY, K. Controlled-flash pyrolysis [DE82-000284] p0111 N82-13196 DURAND, S. The El Paso electric 20-kilowatt photovoltaic system [AIAA PAPER 82-0064] p0060 A82-17761 DURRANT, O. W. The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 DURST, 1. Production of alloys of bismuth telluride for solar thermoelectric generators
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOMOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORE, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction	DUBBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUBCAH, L. M. Ionospheric power beam studies DUBNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS p0050 A82-12502 DURAI-SWAMY, K. Controlled-flash pyrolysis [DR82-000284] p0111 N82-13196 DURAMD, S. The El Paso electric 20-kilowatt photovoltaic system [AIAA PAPER 82-0064] p0060 A82-17761 DURRABT, O. W. The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 DURST, T. Production of alloys of bismuth telluride for solar thermoelectric generators DUTTA, V. Solution grown PDS/CdS multilayer stacks as
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOMOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: preliminary results [USGS-CIRC-837] DORE, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-025961] DOUCET, J. D. A photovoltaic system with energy storage - Batural Bridges National Monument 100-kW system	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWE OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAN, L. M. Ionospheric power beam studies p0147 M82-12542 DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS p0050 A82-12502 DURAI-SWAMY, K. Controlled-flash pyrolysis [DE82-000284] p0111 N82-13196 DURAND, S. The El Paso electric 20-kilowatt photovoltaic system [AIAA PAPER 82-0064] p0060 A82-17761 DURAIT, O. W. The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 DURST, 1. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 A82-10471 DUTTA, V. Solution grown PbS/CdS multilayer stacks as selective absorbers
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDANVILLE, B. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOWOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIEC-837] DORE, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029061] DOUCET, J. D. A photovoltaic system with energy storage - Natural Bridges National Monument 100-kW system [AIAA PAPEE 82-0066] DOUCET. J. D.	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DONALDSON, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DONDANVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DONLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOHOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORE, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-025961] DOUCH, J. D. A photovoltaic system with energy storage - Batural Bridges Mational Monument 100-kW system [AIAA PAPER 82-0066] DOUGALL, R. S.	DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAM PAPER 81-2561] p0128 A82-14020 DUNCAN, L. M. Ionospheric power beam studies DUNNING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [N8A-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS DURAI-SWAMY, K. Controlled-flash pyrolysis [DE82-000284] p0111 N82-13196 DURAMD, S. The El Paso electric 20-kilowatt photovoltaic system [AIAM PAPER 82-0064] p0060 A82-17761 DURRANT, O. W. The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 DURST, T. Production of alloys of bismuth telluride for solar thermoelectric generators DUTTA, V. Solution grown PbS/CdS multilayer stacks as selective absorbers DUECK, J. S.
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDHVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOHOVAM, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORW, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to subsurface of analytical techniques and application of analytical techniques to subsurface of analytical techniques to subsurface of analytical techniques and application of analytical techniqu	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAN, L. H. Ionospheric power beam studies P047 N82-12542 DUNBING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS p0050 A82-12502 DURAI-SWAHY, K. Controlled-flash pyrolysis [D882-000284] p0111 N82-13196 DURAND, S. The El Paso electric 20-kilowatt photovoltaic system [AIAA PAPER 82-0064] p0060 A82-17761 DURABT, O. W. The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 DURST, I. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 A82-10471 DUTTA, V. Solution grown PbS/CdS multilayer stacks as selective absorbers P0041 A82-10472 DWECK, J. S. Energy conservation in distillation [D881-028650] p0018 N82-12581
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDAWYLLE, R. F. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. B. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOWOVAN, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORN, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-025961] DOUCET, J. D. A photovoltaic system with energy storage— Matural Bridges National Monument 100-kW system [AIAA PAPEE 82-0066] DOUGALL, R. S. Well-water-source heat pump field performance study [DE81-024136] DOUGHERTY, E. E.	[AIAA PAPER 81-2547] p0128 A82-14012 DUNBAR, L. B. Proposed 10 MWe OTEC pilot plant for the Commonwealth of the Northern Mariana Islands [AIAA PAPER 81-2561] p0128 A82-14020 DUNCAN, L. M. Ionospheric power beam studies DUNBING, G. J. Towards a high-temperature solar electric converter p0056 A82-15903 Study of radiatively sustained cesium plasmas for solar energy conversion [NASA-CR-166265] p0075 N82-13039 DUPAS, A. P. Market potential and problems for SSPS DURAI-SWAMY, K. Controlled-flash pyrolysis [DE82-000284] p0111 B82-13196 DURAND, S. The El Paso electric 20-kilowatt photovoltaic system [AIAA PAPER 82-0064] p0060 A82-17761 DURRANT, O. W. The development and design of steam/water solar receivers for commercial application [ASME PAPER 81-SOL-4] p0042 A82-10972 DURST, T. Production of alloys of bismuth telluride for solar thermoelectric generators DUTTA, V. Solution grown PDS/CdS multilayer stacks as selective absorbers P0041 A82-10471 DUTTA, S. Energy conservation in distillation [D881-028650] p0018 N82-12581 DYEB, C. W.
DOMASZEWICZ, A. G. Small sodium sulfur battery for solar and wind energy systems p0047 A82-11778 DOWALDSOB, A. B. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] DOWDHVILLE, R. P. Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada [DE82-000529] DOWLEY, S. W. Review of electrochemical energy conversion and storage for ocean thermal and wind energy systems p0126 A82-11832 DOHOVAM, T. J. Biogeochemical evidence for subsurface hydrocarbon occurrence, recluse oil field, Wyoming: Preliminary results [USGS-CIRC-837] DORW, H. C. Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to chemistry of donor solvent liquefaction [DE81-029125] Development and application of analytical techniques to subsurface of analytical techniques and application of analytical techniques to subsurface of analytical techniques to subsurface of analytical techniques and application of analytical techniqu	DUNBAR, A. P. Market potential and problems for SSPS DURAI-SWAMY, K. Controlled-flash pyrolysis (AIAA PAPER 82-0064) DURAID, S. The El Paso electric 20-kilowatt photovoltaic system (AIAA PAPER 82-0064) DURAIND, S. The development and design of steam/water solar receivers for commercial application [AIAA PAPER 81-2561] DURAIT, W. Solution grown PbS/CdS multilayer stacks as selective absorbers P0128 A82-14012 P0128 A82-14020 P0128 A82-14020 P0147 N82-14020 P0147 N82-12542 P0147 N82-12542 P0056 A82-15903 P0075 N82-13039 P0076 A82-17502 P0077 P0

DYRR, P. H.	
Catalyst and reactor development for liquid-phase fischer-tropsch proce	
[DE81-028209]	p0099 N82-11168
DYHI, J. R.	-
Geology of the nahcclite deposits an	
oil shales of the Green River Form Piceance Creek Basin, Colorado	ation in the
	p0105 N82-11683
_	
Ε	
EASON, E. D.	_
Design, cost and performance compart several solar thermal systems for	
Volume 1: Executive summary	Process acat.
[DE81-029881]	p0069 N82-11576
EATON, B. R. Hechanically stable hydride composit	es designed
for rapid cycling	
BATOUGH, D. J.	p0084 A82-16347
Dimethyl sulfate in particulate matt	er from coal-
and oil-fired power plants	-000E 392-16100
EATOUGH, B. L.	p0005 A82-16199
Dimethyl sulfate in particulate matt	er from coal-
and oil-fired power rlants	p0005 A82-16199
RBERHARDT, L. L.	-
<pre>Ecological effects assessment: Requ state-of-the-art</pre>	irements vs
[DE81-028092]	p0032 N82-15598
EBISOZAKI, W.	•
Oceans and ocean currents: Their in climate	fluence on
[DE81-027263]	p0016 N82-11731
EDBN, A. Inexpensive thermographic techniques	
determining reliable solar-collect	
performance	<u>-</u>
[DE82~001151] RDESKUTY. P. J.	p0076 N82-13528
EDESKÜTY, P. J. Cool-down flow-rate limits imposed b	y thermal
stresses in LNG ripelines [DE81-028731]	p0150 N82-14484
EDWARDS, B. E.	PO 150 No2-14464
SOL-CYCLE: A solar-assisted solvent	
<pre>process for asphalt-impregnation o [DE81~903377]</pre>	p0070 N82-11615
EGGERS, A. G.	•
Aluminum blade development for the M 200-kilowatt wind turbine	MO-DO
[NASA-TH-82594]	p0143 N82-14633
EGUREN, J.	
Influence of the junction area to ed on the open-circuit voltage of sil	
	p0058 A82-16133
BHRICKE, K. A. Contributions of space reflector tec	hnology to
food production, local weather man	ipulation and
energy supply, 1985-2020	
EICHERT, H.	p0054 A82-14445
Aspects concerning the safety of hyd	
BICKER, P. J.	p0085 A82-17132
Design, cost and performance compari	
several solar thermal systems for Volume 1: Executive summary	process heat.
[DE81-029881]	p0069 N82-11576
BISCH, J. J.	_
Desulfurization with transition meta [DE81-028935]	p0092 N82-10143
RISENHART, R. L.	-
International Hicrowave Symposium, L CA, June 15-19, 1981, Proceedings	os Angeles,
ca, dule 15 15, 1501, 110cccutage	p0146 A82-17976
BISENHAUBE, D. B.	•
Energy conservation through utilizat mechanical energy storage	100 OI
	p0002 A82-11845
EISENHAUER, S. U. Project DEEP STEAM: Pourth meeting	of the
technical advisory panel	OT CHE
[DE81-029457]	p0144 882-15561

	GUIBALY, P.		
	Current-voltage c	haracteristics of	
	semiconductor-e	lectrolyte junction	
			p0055 A82-15112
BL-	SHARKAWY, A. I.		
		olar energy in Sat	ıdi Arabia - A
	case study		
			p0056 A82-15660
BLJ	ASON, J. R.		
		ill storage in aqı	
	[DE81-028016] ·		p0159 N82-14652
BLJ	ASON, S. D.		
		ass gasification (iastevaters
	using reverse o	SMOS1S	
	[DE82-000698]		p0025 N82-13566
BLI	INGSON, W. A.	61	
		ogy for coal-conve	
	[DB81-028474]		p0100 N82-11169
B.L.I	IOTT, D. C.	lysis of producing	
	gases from biom		synthetic
	[PB81-217614]	ass	p0095 N82-10272
		oduction of liquid	
	[DE81-030085]	oraction of light	p0117 N82-15226
911	LIOTT, R. C.		po 117 BO2-15220
عجد ط		zinc and nickel/in	ron hattery
		electric vehicle	
	[DE81-023572]		p0157 N82-10962
BWE	LIABOV, V. B.		20.0. 202 10302
		he composition and	d antidetonation
	properties of A		
	Proportion of a	- 30 3000000	p0091 A82-15722
EMI	RT, G. H.		£
	Fuels from biomas	s and wastes	
			p0091 A82-14986
RNO	SLAND, G.		•
		synthetic fuel d:	roplets
	[DE81-028391]	-	p0092 N82-10150
BI (GLIH, B. A.		
		he composition and	d antidetonation
	properties of A	I-93 gasoline	
			p0091 A82-15722
BBC	SLISH, C. J.		
		ass-gasification	wastewaters by
	wet-air oxidati	.OA	-0005 #80-10567
	[DE82-000935]		p0025 N82-13567
BN:	ringh, D. J.	daa. Sama amadaa	-
BN:	MINGH, D. J. US energy strateg	ies: Some option	s for
BB?	PINGH, D. J. US energy strateg eliminating oil	ies: Some option Imports by the yo	s for ear 2000
	TIEGH, D. J. US energy strateg eliminating oil [PB81-226052]		s for
	TINGH, D. J. US energy strateg eliminating oil [PB81-226052] ICKSON, A. C.	. imports by the yo	s for ear 2000 p0014 N82-11626
	PIEGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSOB, A. C. Development statu	. imports by the your	s for ear 2000 p0014 N82-11626
	TINGH, D. J. US energy strateg eliminating oil [PB81-226052] ICKSON, A. C.	. imports by the your	s for ear 2000 p0014 N82-11626 we fuel cell
BR:	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] ICKSON, A. C. Development statu system for orbi	. imports by the your	s for ear 2000 p0014 N82-11626
BR:	PINGH, D. J. US energy strateg eliminating oil (PB81-226052) ICKSOH, A. C. Development statu system for orbi	. imports by the your states of a regeneration	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707
BR:	PIEGH, D. J. US energy strateg eliminating oil [PB81-226052] ICKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat	. imports by the your sof a regeneration to the person to by low temper.	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707
BR:	PINGH, D. J. US energy strateg eliminating oil (PB81-226052) ICKSOH, A. C. Development statu system for orbi	. imports by the your sof a regeneration to the period temper in the period temper phase 3	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707
er: er:	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] ICKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis,	. imports by the your sof a regeneration to the period temper in the period temper phase 3	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707
er: er:	PINGH, D. J. US energy strateg eliminating oil (PB81-226052) ICKSOH, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 WST, D.	. imports by the your sof a regeneration to the period temper in the period temper phase 3	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145
er: er:	PINGH, D. J. US energy strateg eliminating oil (PB81-226052) ICKSOH, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 WST, D.	as of a regeneration to by low temper phase 3	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary
er: er:	US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi [BST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957] NST, D. Conceptual design Stirling engine	as of a regeneration temper phase 3	p0123 A82-11806
er: er:	PINGH, D. J. US energy strateg eliminating oil (PB81-226052) ICKSOH, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 NST, D. Conceptual design Stirling engine	s of a regeneration ion by low temper phase 3 of a large coal- g of used catalys	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806
BR: BR: BR:	PIEGH, D. J. US energy strateg eliminating oil (PB81-226052) ICKSOH, A. C. Development statu system for orbi NEST, J. Coal desulfurizat chlorinolysis, (NASA-CR-164957 NST, D. Conceptual design Stirling engine Thermal processir (BEFT-FB-T-80-1	s of a regeneration ion by low temper phase 3 of a large coal- g of used catalys	p0123 A82-11806
BR: BR: BR:	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 MST, D. Conceptual design Stirling engine Thermal processin [BMFT-FB-T-80-1 IST, D. H.	. imports by the years of a regeneration that operation the properties of a large coal-second of used catalys	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts
BR: BR: BR:	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 MST, D. Conceptual design Stirling engine Thermal processin [BMFT-FB-T-80-1 IST, D. H.	s of a regeneration ion by low temper phase 3 of a large coal- g of used catalys	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators
BRI BRI BRI	US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957] NST, D. Conceptual design Stirling engine Thermal processin [BMFT-FB-T-80-1] MST, D. M. Heat pipes for NE	. imports by the years of a regeneration that operation the properties of a large coal-second of used catalys	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts
BRI BRI BRI	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 MST, D. Conceptual design Stirling engine Thermal processir [BMFT-FB-T-80-1 MST, D. M. Heat pipes for NE	as of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys g spacecraft radi	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748
BRI BRI BRI	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 MST, D. Conceptual design Stirling engine Thermal processir [BHFT-FB-T-80-1 MST, D. M. Heat pipes for NE SEAGHI, I. Formation evaluat	is of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys p spacecraft radi	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748
BRI BRI BRI	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi BEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 NST, D. Conceptual design Stirling engine Thermal processir [BHFT-FB-T-80-1 MST, D. M. Heat pipes for NE SHAGHI, I. Pormation evaluat geothermal rese	s of a regenerative tal operation ion by low temper phase 3 of a large coal- ag of used catalys specific paragraphs and the specific paragraphs are specific paragraphs.	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated
BRI BRI BRI BRI	NINGH, D. J. US energy strateg eliminating oil (PB81-226052) ICKSOH, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 NST, D. Conceptual design Stirling engine Thermal processir [BHFT-FB-T-80-1 MST, D. H. Heat pipes for NE SHAGHI, I. Pormation evaluat geothermal ress [DOE/ET-28384/1	s of a regenerative tal operation ion by low temper phase 3 of a large coal- ag of used catalys specific paragraphs and the specific paragraphs are specific paragraphs.	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748
BRI BRI BRI BRI	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 MST, D. Conceptual design Stirling engine Thermal processir [BMFT-FB-T-80-1 MST, D. M. Heat pipes for ME SHAGHI, I. Pormation evaluat geothermal rese [DOE/ET-28384/7 DOE, R. L.	as of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys p spacecraft radi	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 #82-12514
BRI BRI BRI BRI	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 MST, D. Conceptual design Stirling engine Thermal processir [BHFT-FB-T-80-1 MST, D. M. Heat pipes for NH SHAGHI, I. Formation evaluat geothermal rese [DOE/ET-28384/7 DM, R. L. Field demonstrati	s of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys spacecraft radiation in liquid-dometroirs con of the convent	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam
BRI BRI BRI BRI	NINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi BEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 NST, D. Conceptual design Stirling engine Thermal processir [BHFT-FB-T-80-1 HST, D. M. Heat pipes for NE SHAGHI, I. POFMATION evaluat geothermal rese [DOE/ET-28384/7 DN, R. L. Field demonstrati drive process	as of a regenerative tal operation ion by low temper phase 3 of a large coal- end of used catalys By spacecraft radiation in liquid-dometroirs	p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11205 ators p0122 A82-11748 inated p0109 #82-12514 ional steam erials
BRI BRI BRI BRI	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957] NST, D. Conceptual design Stirling engine Thermal processin [BMFT-FB-T-80-1] MST, D. M. Heat pipes for NE SHAGHI, I. FORMATION EVALUAT geothermal res [DOE/ET-28384/7] DW, B. L. Field demonstrat drive process [DE81-026849]	as of a regenerative tal operation tion by low temper phase 3 of a large coal- g of used catalys spacecraft radiation in liquid-dometry tion of the convent with ancillary mat	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 M82-12514 ional steam erials p0115 N82-14522
BRI BRI BRI BRI	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957 MST, D. Conceptual design Stirling engine Thermal processir [BMFT-FB-T-80-1 MST, D. M. Heat pipes for MS SHAGHI, I. Pormation evaluat geothermai ress [DOE/ET-28384/1 DM, B. L. Field demonstrati drive process [DESI-026849] Field demonstrati	is of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys p spacecraft radiation in liquid-domeration ion of the convent of the convent in the	p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam
BRI BRI BRI BRI	US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi BEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957] ST, D. Conceptual design Stirling engine Stirling engine Thermal processif [BHFT-FB-T-80-1] EST, D. M. Heat pipes for NE SHAGHI, I. Formation evaluat geothermal rese [DOE/ET-28384/] DN, B. L. Field demonstrati drive process if the proce	as of a regenerative tal operation tion by low temper phase 3 of a large coal- g of used catalys spacecraft radiation in liquid-dometry tion of the convent with ancillary mat	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam erials
BR: BR: BR: BR:	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957] NET, D. Conceptual design Stirling engine Thermal processin [BHFT-FB-T-80-1] IST, D. M. Heat pipes for NE SHAGHI, I. Pormation evaluat geothermal rese [DDE/ET-28384/7] OM, R. L. Field demonstrati drive process t [DE81-026849] Field demonstrati drive process t [DE81-026962]	is of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys p spacecraft radiation in liquid-domeration ion of the convent of the convent in the	p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam
BR: BR: BR: BR:	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957] MST, D. Conceptual design Stirling engine Thermal processin [BMFT-FB-T-80-1] MST, D. M. Heat pipes for NE SHAGHI, I. Pormation evaluat geothermal rescent [DOE/ET-28384/7] DE, B. L. Field demonstrati drive process to [DB81-026849] Field demonstrati drive process to [DB81-026962] FA, J.	as of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys g of used catalys g spacecraft radive cion in liquid-don croirs critical convent with ancillary mat con of the convent with ancillary mat	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam erials p0115 N82-14523
BR: BR: BR: BR:	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957] MST, D. Conceptual design Stirling engine Thermal processin [BMFT-FB-T-80-1] MST, D. M. Heat pipes for NE SHAGHI, I. Pormation evaluat geothermal rescent [DOE/ET-28384/7] DE, B. L. Field demonstrati drive process to [DB81-026849] Field demonstrati drive process to [DB81-026962] FA, J.	is of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys p spacecraft radiation in liquid-domeration ion of the convent of the convent in the	p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam erials p0115 N82-14523 ells
BRI BRI BRI BRI BRI	RINGH, D. J. US energy strateg eliminating oil [PB81-226052] [CKSON, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957] MST, D. Conceptual design Stirling engine Thermal processin [BMFT-FB-T-80-1] MST, D. M. Heat pipes for NE SHAGHI, I. Pormation evaluat geothermal rescent [DOE/ET-28384/7] DE, B. L. Field demonstrati drive process to [DB81-026849] Field demonstrati drive process to [DB81-026962] FA, J.	as of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys g of used catalys g spacecraft radive cion in liquid-don croirs critical convent ion of the convent	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam erials p0115 N82-14523
BRI BRI BRI BRI BRI	US energy stratege eluminating oil [PB81-226052] [CKSON, A. C. Development status system for orbinating eluminating eluminating eluminating elumination eluminatio	is of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys spacecraft radiction in liquid-dometrooirs ion of the convent with ancillary matical and the convent with ancillary matical de//p-InP solar c	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 M82-12514 ional steam erials p0115 N82-14522 ional steam erials p0115 N82-14523 ells p0058 A82-16471
BRI BRI BRI BRI BRI	US energy stratege eluminating oil [PB81-226052] [CKSON, A. C. Development status system for orbinating eluminating eluminating eluminating elumination eluminatio	is of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys spacecraft radiction in liquid-dometrooirs ion of the convent with ancillary matical and the convent with ancillary matical de//p-InP solar c	p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam erials p0115 N82-14523 ells
BRI BRI BRI BRI BRI BRI BRI BRI BRI BRI	US energy stratege eluminating oil [PB81-226052] [CKSON, A. C. Development status system for orbinating eluminating eluminating eluminating elumination eluminatio	is of a regenerative tal operation ion by low temper phase 3 of a large coal- g of used catalys spacecraft radiction in liquid-dometrooirs ion of the convent with ancillary matical and the convent with ancillary matical de//p-InP solar c	polis M82-11524 polis M82-11626 we fuel cell polis A82-11707 ature polis M82-11145 fired stationary polis A82-11806 ts polis M82-12205 ators polis A82-11748 inated polis M82-12514 ional steam erials polis M82-14522 ional steam erials polis M82-14523 ells polis M82-14523
BRI BRI BRI BRI BRI BRI BRI BRI BRI BRI	SEEV, V. S. ANSINATION OF PARTY OF PART	is of a regenerative tal operation ion by low temper phase 3 of a large coal- ing of used catalys go fused catalys go fused catalys go fused catalys go fused catalys ion in liquid-don ervoirs ion of the convent with ancillary mat ion of the convent with ancillary mat ide//p-InP solar c the voltage concent the mass, and size	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam erials p0115 N82-14523 ells p0058 A82-16471 rator solar cells p0047 A82-11796
BRI BRI BRI BRI BRI BRI BRI BRI BRI BRI	US energy strateg eliminating oil [PB81-226052] [CKSOB, A. C. Development statu system for orbi MEST, J. Coal desulfurizat chlorinolysis, [NASA-CR-164957] MEST, D. Conceptual design stirling engine Thermal processim [BMFT-FB-T-80-1] MEST, D. M. Heat pipes for NE SEAGHI, I. Pormation evaluat geothermal rese [DDE/ET-28384/7] DE, R. L. Field demonstrati drive process in [DE81-026962] Field demonstrati drive process in [DE81-026962] FIA, J. n-/indium tin oxi MES, J. C. Hultijunction higher solar vapor-tur SEEEV, V. S. Analysis of power solar vapor-tur	as of a regenerative tal operation sion by low temper phase 3 a of a large coal- ag of used catalys spectraft radivers cion in liquid-don cion in liquid-don city in a convent with ancillary mat and of the convent with ancillary mat and of the convent convertion of the convent co	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam erials p0115 N82-14523 ells p0058 A82-16471 rator solar cells p0047 A82-11796
BRI BRI BRI BRI BRI BRI BRI BRI BRI BRI	SEEV, V. S. ANSINATION OF PARTY OF PART	as of a regenerative tal operation sion by low temper phase 3 a of a large coal- ag of used catalys spectraft radivers cion in liquid-don cion in liquid-don city in a convent with ancillary mat and of the convent with ancillary mat and of the convent convertion of the convent co	s for ear 2000 p0014 N82-11626 we fuel cell p0153 A82-11707 ature p0098 N82-11145 fired stationary p0123 A82-11806 ts p0016 N82-12205 ators p0122 A82-11748 inated p0109 N82-12514 ional steam erials p0115 N82-14522 ional steam erials p0115 N82-14523 ells p0058 A82-16471 rator solar cells p0047 A82-11796

BUELL, R. Advanced high temperature thermoelectrics for	PILLO, J. A. Pusion as a source of synthetic fools
Advanced high temperature thermoelectrics for space power	Fusion as a source of synthetic fuels [BBL-29281] p0086 M82-11257
p0125 A82-11823	PINGER, S. Integration of decentralized generators with the
F	electric power grid
PABER, E.	[DB81-029731] p0006 M82-10334 PIBBBLL, W.
Development of organic geochemical and isotope techniques for hydrocarbon exploration	Solar power satellite microwave power transmission and reception system
[BMFT-FB-T-80-076] p0097 N82-10482 PAIRBE, V.	PINHIGAN, B. P. p0145 A82-11743
On the efficiency of thermal engines with power output - Barmonically driven engines	Energy savings by means of fuel-cell electrodes in electro-chemical industries
PAH, J. C. C.	[DE81-030975] p0018 N82-12582 PINOCCHI, P. L.
<pre>Bfficient Si solar cells by low-temperature solid-phase epitary</pre>	Methods and problems of industrial-scale electric power generation from solar energy
p0043 A82-11344	p0050 A82-12506
PARBER, P. S. Economic and environmental tradeoffs in coal conversion	FIROR, K. Effects of processing parameters on thick film inks used for solar cell front metallization
[CONF-800608-8] p0009 N82-10598	p0058 A82-16474
PARRELL, J. J. Data report for the northeast residential	PISCHER, B. J. Process for removing sulfur oxides from gases with
experiment station, June 1981	direct production of a usable finished reaction
[DE82-000068] p0077 N82-13533 PASSIHI, H. R.	product [BHFT-FB-T-81-102] p0029 N82-15142
Algorithm for computing in-situ combustion oil recovery performance	FISCHER, M. Aspects concerning the safety of hydrogen
[DE81-030340] p0098 N82-11153	p0085 A82-17132
PAUST, C. R. Review of simulation techniques for Aguifer	PISH, J. D. Solar-central-receiver fuels and chemicals
Thermal Energy Storage (ATES)	[DE82-000941] p0077 N82-13530
[DE81-029943] p0156 N82-10532 PAUTH, D. J.	FISH, M. J. Comparative economics of solar thermal central
Synthesis gas conversion to liquid fuels using promoted fused iron catalysts	receivers [DE81-029623] p0072 N82-12601
[DE81-030857] p0108 N82-12259 FAZSOLARE, R.	Solar thermal central receivers for industrial process heat generation: User views and
Guidebook for solar process-heat applications	recommendations for commercialization
[DE81-027977] p0072 B82-12598 PEARWSIDES, J. J.	[DE81-029611] p0073 M82-12618 FISHER, H-
US energy strategies: Some options for eliminating oil imports by the year 2000	Relaxation of geothermal-reservoir stresses induced by heat production
[PB81-226052] p0014 N82-11626 PBASBY, D.	[DE81-032024] p0105 N82-11715 FISHER, R. K., JR.
Industrial process heat applications for solar thermal technologies	Design considerations for a 1500 M head 300-600 MW double stage reversible pump/turbine with
[DE81-025934] p0081 M82-15545 PEDOSOVA, G. B.	regulation p0154 A82-11782
Electrical characteristics of high-voltage	PITZGERALD, C.
germanium photoconverters under high illumination intensities n0040 A82-10391	Urban ecosystem and resource-conserving urbanism 11 Third World cities 12 PR1-1298541
p0040 A82-10391 Cascade photogenerators based on silicon and	[DE81-029854] p0016 N82-11995 FITZPATRICK, G. O.
germanium matrıx photoconverters	High temperature cogeneration with thermionic
PRIE, R. p0044 A82-11422	burners p0124 A82-11817
An assessment of nonfossil hydrogen [PB81-246522] p0087 M82-15231	The design of series-parallel connected thermionic converter arrays
PELDER, W.	p0124 A82-11820
Rate coefficients of combustion/fuel conversion reactions by high-temperature photochemistry	PITZSIMBOBS, G. W. SPS solid state antenna power combiner
[DE81-027965] p0023 N82-13192	p0149 N82-12567
PRIDMAM, S. L. SOLPLAN report: An assessment of barriers and	Computational tools for pulverized-coal combustion
incentives to conservation and alternative-energy use in the residential sector	[DE81-028582] p0098 N82-11148 PLAIM, S.
in Wisconsin	Agricultural policies and biomass fuels
[DOE/CS-30292/3] p0013 N82-11614 PELTOB, L. B.	PLAIR, S. J. p0001 A82-11542
DOE small-hydropower demonstration program [DE81-027819] p0020 N82-12636	Costs for alternative grain-residue-collection systems
PERSTERMACHER, J. B.	[DE81-029072] p0110 N82-12633
Industrial applications of MHD high temperature air heater technology	FLECK, G. W. Power management of multi-hundred kilowatt
[AIAA PAPER 81-2588] p0130 A82-14037	spacecraft power systems
PERRALL, J. Assessment of advanced coal gasification processes	PLETCHEE, C. A. J.
[NASA-CR-164949] p0098 N82-11146	Computational analysis of diffuser-augmented wind turbines
PERRARI, G. Aplanatic double reflection system for	p0132 A82-16743
thermophotovoltaic applications - Design p0060 A82-17293	FLOOD, D. Gallium arsenide solar cells-status and prospects
PILIBOV, V. S.	for use in space
Increasing power and efficiency by dynamic suppression of ionization instability in a plasma p0127 A82-12897	p0046 A82-11765

FLY, G.

A compact, efficient thermoelectric module for a
space reactor
p0122 A82-11749
PLINE, T. Low-to-moderate temperature geothermal resource
assessment for Nevada, area specific studies
[DE81-030487] p0096 N82-10475
POKIH, V. G.
Thermal deformation of concentrators in an
antisymmetric temperature field
p0062 A82-18698
FOLEY, J. S.
Wind energy conversion system design and analysis
program
p0133 A82-17630
FOLEY, R. T.
Evaluation of organic acids as fuel cell electrolytes
p0127 A82-12938
PORD, H.
Fire-protection research for energy technology:
Fy 80 year end report
[DE82-000970] p0161 N82-14649
POREMAN, R. P.
US energy strategies: Some options for
eliminating oil imports by the year 2000
[PB81-226052] p0014 N82-11626
PORMAN, S. R. Performance of terrestrial photovoltaic modules at
MIT Lincoln Laboratory experimental photovoltaic
systems
[DE81-029995] p0064 N82-10519
PORREST, L.
Assessment of flywheel system benefits in selected
vehicle applications
[DB81-025976] p0158 N82-11997
Evaluation of techniques for reducing in-use
automotive fuel consumption
[PB81-233298] p0026 N82-13985
POSTER-PEGG, R. W.
Coal fired air turbine cogeneration p0089 182-11836
POSTER, D. B.
Survey of proposed methods of burning alcohol in
diesel engines
[DE81-025834] p0030 N82-15219
FOX, R. L.
POX, R. L. Project DEEP STEAM: Fourth meeting of the technical advisory panel
FOX, R. L. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. H.
POX, R. L. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 FRAAS, L. H. A new low temperature III-V multilayer growth
POX, R. L. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 FRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor
FOX, R. L. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] po144 N82-15561 FRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 N82-13803
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. H. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L.
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1:
POX. R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities
POX. R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E.
POX, R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a
POX. R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential
POX. R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013
POX. R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 FRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626
POX, R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 FRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRAMCESCHETTI, G.
POX. R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] PRANCESCHETTI, G. Hechanical and nonlinear effects in microwave
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] PRAMCESCHETTI, G. Mechanical and nonlinear effects in microwave power transmission
POX. R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAAS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 FRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCESCHETI, G. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504
POX. R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRANIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCESCHETTI, G. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504
POX, R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCESCHETTI, G. Hechanical and nonlinear effects in microwave power transmission p0145 A82-12504 FRANCIS, C. W. Coal conversion solid waste disposal
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCESCHETTI, G. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 PRANCIS, C. W. Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680
POX, R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCIS, C. W. Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 PRANCIS, E. J.
POX, R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCESCHETTI, G. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 PRANCIS, C. W. Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680
POX. R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 FRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 FRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 FRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 FRANCIS, C. W. Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 FRANCIS, B. J. An estimate of OTEC costs, market potential and
POX, R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCESCHETTI, G. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 PRANCIS, C. W. Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 PRANCIS, B. J. An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 PRANK, A. J.
POX. R. L. Project DREP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCIS, C. W. Coal conversion solid waste disposal [DE81-028567] p0145 A82-12504 PRANCIS, B. J. An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 PRANK, A. J. Photoelectrochemical solar cells: Stabilization
POX. R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCESCHETTI, G. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 PRANCIS, C. W. Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 PRANCIS, B. J. An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 PRANK, A. J. Photoelectrochemical solar cells: Stabilization of small-band-gap semiconductor in aqueous
POI, R. L. Project DEEP STEAM: Fourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 FRAIZE, W. B. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCESCHETTI, G. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 FRANCIS, C. W. Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 PRANCIS, B. J. An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 PRANK, A. J. Photoelectrochemical solar cells: Stabilization of small-band-gap semicenductor in aqueous solution by surface-attached organic conducting
POX. R. L. Project DEEP STEAM: Pourth meeting of the technical advisory panel [DE81-029457] p0144 N82-15561 PRAMS, L. M. A new low temperature III-V multilayer growth technique - Vacuum metalorganic chemical vapor deposition p0053 A82-13803 PRADKIN, L. Enhancement of methane gas production using an industrial waste in anaerobic digestion [DE81-023819] p0095 N82-10267 Solid and hazardous energy wastes: Synfuels. 1: Review of research activities [DE81-028503] p0014 N82-11644 PRAIZE, W. E. Solar thermal cost goals - Implementing a methodology for assessing break-even value and market potential [AIAA PAPER 81-2550] p0054 A82-14013 US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 N82-11626 PRANCESCHETTI, G. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 PRANCIS, C. W. Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 PRANCIS, B. J. An estimate of OTEC costs, market potential and proof-of-concept vessel financing [AIAA PAPER 81-2567] p0003 A82-14024 PRANK, A. J. Photoelectrochemical solar cells: Stabilization of small-band-gap semiconductor in aqueous

```
PRANK, D. N.
   Mechanical energy storage technology project
                                             p0155 N82-10508
     [DB81-029753]
PRANKE, P. B.

Bot dry rock geothermal energy development program
p0097 N82-10560
PRANKLIH, R. D.
Pulsed Power Research colloquium
                                             p0150 N82-14638
     [AD-A105770]
PREBNÀN, J. W.
   Direct conversion of light to radio frequency energy
                                             p0045 A82-11712
PRBEMAN, T. L.
   Optimization of solar heating and cooling systems
                                             p0072 N82-12599
     [NP-1903997]
FREIWALD, D. A.
   Alternative transportation vehicles for
     military-base operations
                                             p0005 A82-16348
FRESE, J.
   Evaluation of shale oil as a utility gas-turbine
     fuel
     [ DE81-904234 ]
                                             D0107 N82-12251
FREYER, J.

K/u/-band flat-profile Si-IMPATT diodes with
     10-percent efficiency
                                             p0058 A82-16132
FRICKER, H.
   The design of a sodium-cooled 2.7 MW receiver for
     a solar power plant
                                             p0059 A82-17126
   Solar project at Almeria nears completion
                                            p0075 N82-12647
FRID, S. B.
   Analysis of the optical characteristics of solar
     collectors
                                             p0052 A82-13715
PRIEDRAN, N.
   Verification of BLAST by comparison with
     measurements of a solar-dominated test cell and
     a thermally massive building
     [DE81-029883]
                                            p0082 N82-15578
PRIEFELD, J. M.
Testing of the U.S. Solar Pilot Plant receiver
[ASME PAPER 81-SOL-3] p0041 A82
                                            p0041 A82-10971
FUCHS, V.

RF-driven Tokamak reactor with sub-ignited,
     thermally stable operation [DE81-029437]
                                             p0139 N82-11935
PUJITA, T.

Configuration selection study for isolated loads
     using parabolic dish modules
[AIAA PAPER 81-2549]
                                             p0061 A82-18223
PUKUDA, S.
   Investigations on a Se-CdO photovoltaic cell
                                            p0132 A82-16052
PULBBUIDER, C. K.
   SOLPLAN report: An assessment of barriers and
     incentives to conservation and
     alternative-energy use in the residential sector
     in Wisconsin
     [ DOE/CS-30292/3]
                                             D0013 N82-11614
FULLER, P. H.
   Photovoltaic market analysis program: Background,
     model development, applications and extensions [DE81-029711] p0073 N82-1
                                            p0073 N82-12609
FULLER, H. H.
Design and development of a reciprocating
     low-temperature freon expander
     [DE81-028609]
                                             p0023 N82-13392
FULLER, R.
   Sulfur pollution control. Phase 1:
                                             The disposal
     program
                                            p0014 N82-11652
The disposal
      Î PB81-2226121
   Sulfur pollution control. Phase 1:
     program (sections 5 through 7)
[PB81-222804]
                                             p0015 N82-11655
PULLER, W.
   Incremental cooling load determination for passive
     direct dain heating systems
     [DB81-029882]
                                             p0081 N82-15575
PULTON, D. G.
   Control system development for a 1 MW/e/ solar
     thermal power plant
                                             D0048 A82-11801
PURUHAMA, S.
   A LH2 engine fuel system on board - Cold GH2
     injection into two-stroke engine with LH2 pump
[ASME PAPER 81-HT-81] p0083 A82-1
```

p0083 A82-10966

A central tower solar test facility /RM/CTSTF/

p0048 A82-11797

PUSEGHI, L. J. GEE, R. Thermionic combustor application to combined gas Near-term improvements in parabolic troughs: An economic and performance assessment and steam turbine power plants p0124 A82-11818 [DE82-001158] D0073 #82-12615 PYMB, R. P. Modeling and testing a salt gradient solar pond in Pulverized-fuel combustion: Modeling and scaleup northeast Ohio methodologies D0043 A82-11210 [DE81-026546] p0093 N82-10158 GENIS, A. P.

Series resistance effects in 20 sq cm indium tin oxide-polycrystalline silicon solar cells p0051 A82-1: G GABRIELLI, G. Characteristics and trends of energy consumption GRRASIMOV, IU. P. in transport missions with aircraft and surface Effect of wick dryness on the performance of heat vehicles pipes with separate channels p0001 A82-10495 p0005 A82-16272 GERHAHI, M. S. GADGIL. S. B. Spectrally selective copper sulphide coatings Selected studies of four high-temperature p0040 A82-10468 air-pollution sources p0015 B82-11680 Performance of advanced chromium electrodes for the NASA Redox Energy Storage System GERSHKOFF, I. The use of flight management computers in air [NA SA-TM-82724] p0159 N82-12574 carrier operations in the 1980s [AD-A105621] GALES, C.

The storage of hydrogen in the form of metal p0027 N82-14071 GERSTHANN, J. hydrides: An application to thermal engines [NASA-TH-76609] p0086 N82-Conceptual design of a large coal-fired stationary p0086 N82-11225 Stirling engine GALLAGHER, W.

Energy and development in Central America. Volume
1: Regional assessment p0123 A82-11806 GEWEHR, H. W. Lightning protection for composite rotor blades p0133 A82-17631 [PB81-231540] p0032 N82-15589 Energy and development in Central America. Volume 2: Country assessments [PB81-231557] p0032 N82-1559 GHAFFARI, H. T. Comparative thermal performance of direct gain, p0032 N82-15590 Trombe, and sunspace walls [DE81-030546] GANGWAL, S. K. Vapor-phase cracking and wet oxidation as p0081 N82-15571 GHIDOUCHE, H. potential pollutant control techniques for coal Theoretical and numerical resolution of a gasification mathematical model of the release of solar p0015 N82-11661 [PB81-219594] energy from storage GARCIA, D. D. Structural evolution of three p0061 A82-18232 GHUSH, G., JR. geopressured-geothermal areas in the Texas Gulf Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies Coast [DE81-030487] [DE81-029799] D0118 N82-15505 p0096 N82-10475 GARDHER, J.

Hot dry rock geothermal prospects, 1981
[DE81-025305] p0 GIBBS, R. J. Cryogenic testing of 100-m superconducting power transmission test facility
[DE81-028331] p0150 N82-13 p0119 N82-15559 GARRETT, L. B. p0150 N82-13517 Comparative analyses of space-to-space central GIDASPOW, D. Separation of particles from coal derived liquids via surface charge properties power stations D0150 N82-14202 [NASA-TP-1955] GARRIDO, J.

Numerical simulation of sclar cell open circuit [DE81-029088] p0092 N82-10141 GILBERT, B. R. voltage decay Environmental and economic comparison of advanced p0041 A82-10658 processes for conversion of coal and biomass Investigations of the OCVD transients in solar cells p0043 A82-11334 into clean energy [PB81-234239] p0023 N82-13256 GARRISON. W. E. GILL, G. E. Parallel evaluation of air-and oxygen-activated Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, sludge [PB81-246712] Massachusetts, and Rhode Island p0034 N82-15633 [DE81-030895] GARY, N. B. p0104 ¥82-11523 Chronic exposure of a honey bee colony to 2.45 GHz GILL. P. continuous wave microwaves Modelling of the jet-stream Fluidyne p0003 A82-14347 p0124 A82-11812 GILLETTE, J. L. GATES. H. T. Solar panel current degradation factors Preliminary evaluation of advanced coal-based electricity-generating technologies by means of system-integration analysis p0045 A82-11759 GAUTHIER, C. L. [DE81-029989] Third automotive fuel economy research contractors p0105 N82-11573 Analysis of potential cogeneration impacts on electricity generation by the Central Maine coordination meeting [PB81-222754] p0014 B82-11627 Power Company GAUTHIER, R. A study of the purification process during the [DE81-029991] p0028 N82-14650 GILLHAM, L. D.
Process development for improved SEC options. elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic Kerr-McGee critical solvent deashing and conversion p0057 A82-16054 fractionation studies GAUTERAUX, W. T., JR.
Methane production from alkaline food waste [DE81-903785] p0114 N82-14380 GILBORE, B. H. p0092 N82-10115 Energy transfer in wind-assist electric power systems An integrating sphere based on absolute method for measuring sclar absorptance D0130 A82-14359 GINLEY, D. S. p0058 A82-16247 The optimization of solar conversion devices p0039 A82-10025 Research opportunities in new energy-related GISLOE, R.

p0161 A82-15377

materials

GLAS, R.	GORMAN, D. H.	
Overview of active solar absorption/Rankine		an advanced water/steam
cooling program [DE81-028041] p0082 h	Receiver for a sola 82-15577 [ASME FAPER 81-SOL-	r thermal central power system 51 p0042 A82-10973
GLASS, D. R.	GOUSKOV, L.	5) P0042 NOL 10515
Study of the formation of submicron particul		p-InP solar cells
generated by coal combustion		p0058 A82-16471
	82-10586 GOVE, R. H.	alimations of biomoss
Fuel nitrogen conversion during fuel rich	energy system use	g implications of biomass
combustion of pulverized coal and char	[DE81-029956]	p0028 N82-14664
	82-12156 GRAHL-NIELSEN, O.	• • • • • • • • • • • • • • • • • • • •
GLASS, H. C.		ion by chemical analysis
Series vs. shunt regulators for power contro		p0115 N82-14583
satellite power systems	GRALLERT, H. 82-11738 Comparison of concept	s for solar-heated or
GLEASON, T. E.		tion and compression cooling
Application of HTGR process heat to cil shall		nditioning and food
retorting	preservation purpos	
p0090 i	82-11851 [BMFT-FB-T-81-165] GRAMMEL, S. J.	p0080 N82-15541
Algorithm for computing in-situ combustion of		solar and coal
recovery performance	[DE81-023545]	p0137 N82-10553
[DE81-030340] p0098 1	82-11153 GRANT, P. R., JR.	
GOBRECHT, J.		erification for Air Force Bases
V205-Si photovoltaic cells	[DE81-027482] 82-12824 GRANT, T.	p0112 N82-13520
GODBER, H. W.		mal-reservoir stresses
Low-level radioactive waste: An introductor		
Owerwiem	[DE81-032024]	p0105 N82-11715
[DE81-026334] p0022 1		
GOERGERS, B. A technological approach towards future large		ite Power System on low Earth
solar arrays	[PB81-232019]	p0150 N82-13157
	82-14446 GRASSE, W.	•
GOPP, P.		ental projects on the Spanish
Hot dry rock geothermal prospects, 1981	Plataforma Solar	
[DE81-025305] p0119 ! Schlumberger resistivity study of the Jemez	82-15559 GRASSO, A. P.	p0059 A82-17128
Springs region of northwestern New Mexico		il as a utility gas-turbine
[DE81-025302] p0119 1	82-15661 fuel	• •
GOFF, P. G.	[DE81-904234]	p0107 N82-12251
Assessment of I.C. engines as drivers for he		ductry opginonmental data
actuated heat rumps [DE81-024086] p0139 P		dustry environmental data asis on remote sensing
GOLDBERG, P. M.	20,11101010101010101011011011011011011011	
		p0027 N82-14557
Effects of components of synfuels on soot for		-
[DE81-027961] p0101 i	82-11242 Power management of m	ulti-hundred kilowatt
[DE81-027961] p0101 1 GOLDMAN, J. L.		ulti-hundred kilowatt
[DE81-027961] p0101 i GOLDMAN, J. L. Rechargeable lithium/wanadium oxide cells	82-11242 Power management of m spacecraft power sy	ulti-hundred kilowatt
[DE81-027961] p0101 1 GOLDMAN, J. L.	82-11242 Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies:	ulti-hundred kilowatt stems p0046 A82-11769 Some options for
[DE81-027961] p0101 19 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSHID, H. J.	82-11242 Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp	p0046 A82-11769 Some options for ports by the year 2000
[DE81-027961] p0101 19 GOLDMAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 49 GOLDSMID, H. J. Production of alloys of bismuth telluride for	82-11242 Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp r [PB81-226052]	ulti-hundred kilowatt stems p0046 A82-11769 Some options for
[DE81-027961] p0101 is GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 is GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators	82-11242 Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B.	pulti-hundred kilowatt stems p0046 A82-11769 Some options for orts by the year 2000 p0014 N82-11626
[DE81-027961] p0101 for GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 for GOLDSMID.	82-11242 Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp r [PB81-226052]	pulti-hundred kilowatt stems p0046 A82-11769 Some options for orts by the year 2000 p0014 N82-11626
[DE81-027961] p0101 M GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 M GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 M GOMEZ, J. H. Finite Lambertian source analysis of concent	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me	pulti-hundred kilowatt (stems p0046 A82-11769 Some options for p0014 N82-11626 (stal complexes p0058 A82-16124
[DE81-027961] p0101 is GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 is GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 is GOMEZ, J. M. Finite Lambertian source analysis of concentral application to solar reflectors	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. 82-10471 Solar chemistry of me rators GREEN, D. A. Coal gasifier paramet	pout industrial value of the stems pout of the s
[DE81-027961] p0101 a GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors p0060 a	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil img [PB81-226052] GRAY, H. B. Solar chemistry of me GREEN, D. A. Coal gasifier paramet pollutant production	poulti-hundred kilowatt stems poul6 A82-11769 Some options for orts by the year 2000 poul4 N82-11626 stal complexes pouls A82-16124 ers influencing environmental
[DE81-027961] p0101 for GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B.	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me GREEN, D. A. Coal gasifier paramet pollutant productic [PB81-221301]	pout in hundred kilowatt stems pout 6 A82-11769 Some options for ports by the year 2000 pout 1 N82-11626 tal complexes pout 8 A82-16124 ters influencing environmental pout 1 N82-11273
[DE81-027961] p0101 a GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors p0060 a	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. 82-10471 Solar chemistry of me Coal gasifier paramet pollutant production [PB81-221301] Vapor-pnase cracking potential pollutant	pout in hundred kilowatt stems pout 6 A82-11769 Some options for ports by the year 2000 pout 1 N82-11626 tal complexes pout 8 A82-16124 ters influencing environmental pout 1 N82-11273
[DE81-027961] p0101 R GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoeners p0124 1	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil img [PB81-226052] GRAY, H. B. 82-10471 rators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-pnase cracking potential pollutant gasification	pout a literal results of the stems pout of the stems
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators GOMEZ, J. H. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoeners GOODBERAD, D. T.	Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-219594]	pout included kilowatt stems pout A82-11769 Some options for ports by the year 2000 pout N82-11626 stal complexes pout A82-16124 sers influencing environmental pout N82-11273 and wet oxidation as
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators GOMBZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide therm converters GOODBERAD, D. T. Relational methodology for integrating and	Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Trators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-219594] GREEN, B. J.	p0046 A82-11769 Some options for p0044 N82-11626 stal complexes p0058 A82-16124 ers influencing environmental p0011 N82-11273 and wet oxidation as control techniques for coal p0015 N82-11661
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors p0060 18 GOODALE, D. B. Characteristics of CVD silicon carbide thermonverters p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data	82-11242 Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. 82-10471 Solar chemistry of me Coal gasifier paramet pollutant production [PB81-221301] Vapor-pnase cracking potential pollutant gasification [PB81-219594] GREEN, B. J. Measured performance	p0046 A82-11769 Some options for p0044 N82-11626 stal complexes p0058 A82-16124 ers influencing environmental p0011 N82-11273 and wet oxidation as control techniques for coal p0015 N82-11661
[DE81-027961] p0101 for GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoeners converters GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery	Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Trators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-219594] GREEN, B. J.	p0046 A82-11769 Some options for p0044 N82-11626 stal complexes p0058 A82-16124 ers influencing environmental p0011 N82-11273 and wet oxidation as control techniques for coal p0015 N82-11661
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide them converters GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] p0118 18	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Record gasifier paramet pollutant production [PB81-221301] Vapor-pnase cracking potential pollutant gasification [PB81-219594] GREEN, B. J. Measured performance evaporators [DE81-024355] GREEN, W. L.	pout in hundred kilowatt stems pout 6 A82-11769 Some options for ports by the year 2000 pout 1 N82-11626 etal complexes pout 8 A82-16124 eers influencing environmental n pout 1 N82-11273 and wet oxidation as control techniques for coal pout 1 N82-11661 of falling-jet flash put 1 N82-10565
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermonverters GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] p0118 18 GOODBAN, F. K. Use of coal cleaning for compliance with SOC	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. 82-10471 Frators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-pnase cracking potential pollutant gasification [PB81-219594] GREEN, B. J. Measured performance evaporators [DE81-024355] GREEN, W. L. Proposed 12.5 MWe she	pout a large stems pout 6 A82-11769 Some options for pouts by the year 2000 poul 4 N82-11626 stal complexes pout 82-16124 sers influencing environmental pout 1 N82-11273 and wet oxidation as control techniques for coal pout 5 N82-11661 of falling-jet flash put 1 N82-10565 elf-mounted OTEC pilot plant
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMEZ, J. H. Pinite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoeners p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] p0118 18 GOODBAN, F. K. Use of coal cleaning for compliance with SO2 emission regulations	82-11242 Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me 82-10471 Frators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-21394] GREEN, H. J. Heasured performance evaporators [DE81-024355] GREEN, W. L. Proposed 12.5 MWe she for power, water and	pout and wet oxidation as control techniques for coal pout 182-11661 pof falling-jet flash and wet out of falling-jet plant described as control techniques for coal pout 182-10565 and wet out of falling-jet flash pout 182-10565 and mariculture at St. Croix
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMEZ, J. H. Pinite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoeners p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] p0118 18 GOODBAN, P. K. Use of coal cleaning for compliance with SO2 emission regulations	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. 82-10471 Frators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-pnase cracking potential pollutant gasification [PB81-219594] GREEN, B. J. Measured performance evaporators [DE81-024355] GREEN, W. L. Proposed 12.5 MWe she	pout and wet oxidation as control techniques for coal pouts (stems) pouts by the year 2000 pout N82-11626 at al complexes pout N82-16124 pout N82-16124 and wet oxidation as control techniques for coal pout N82-11661 of falling-jet flash put N82-10565 alf-mounted OTEC pulot plant design are control techniques at St. Croix
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermony converters p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] p0118 18 GOODBAN, F. K. Use of coal cleaning for compliance with some mission regulations [P81-247520] p0034 18 GOPALAM, B. S. V. Effect of junction depth on the performance	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me 82-10471 Frators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-219594] GREEN, B. J. Heasured performance evaporators [DE81-024355] GREEN, W. L. Proposed 12.5 MWe she for power, water an [AIAA PAPER 81-2546] GREENMAN, P.	pout and wet oxidation as control techniques for coal pouts (stems) pouts by the year 2000 pout N82-11626 at al complexes pout N82-16124 pout N82-16124 and wet oxidation as control techniques for coal pout N82-11661 of falling-jet flash put N82-10565 alf-mounted OTEC pulot plant design are control techniques at St. Croix
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoelectric solution converters p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] p0118 18 GOODBAN, F. K. Use of coal cleaning for compliance with SO2 emission regulations [PB81-247520] p0034 18 GOPALAH, B. S. V. Effect of junction depth on the performance diffused n/+/p silicon sclar cell	R2-11242 Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me grade in the strategies of the strategi	pout 1-hundred kilowatt pout 6 A82-11769 Some options for ports by the year 2000 pout 1 N82-11626 detal complexes pout 1 N82-16124 ders influencing environmental pout 1 N82-11273 and wet oxidation as control techniques for coal pout 1 N82-11661 of falling-jet flash put 1 N82-10565 def-mounted OTEC pulot plant defined mariculture at St. Croix put 1 N82-14011 cors for photovoltaic arrays
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoelectric converters p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] GOODBAN, F. K. Use of coal cleaning for compliance with Solemission regulations [PB81-247520] GOPALAM, B. S. V. Effect of junction depth on the performance diffused n/+/p silicon sclar cell	Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Record gasifier paramet pollutant production [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-21394] GREEN, H. J. Measured performance evaporators [DE81-024355] GREEN, W. L. Proposed 12.5 MWe she for power, water am [AIAA PAPER 81-2546] GREENMAN, P. Nonimaging concentration space	pout in hundred kilowatt stems pout A82-11769 Some options for ports by the year 2000 pout N82-11626 stal complexes pout N82-16124 sers influencing environmental pout N82-11273 and wet oxidation as control techniques for coal pout N82-11661 of falling-jet flash put oxidation as control techniques for coal pout N82-10565 elf-mounted OTEC pulot plant d mariculture at St. Croix put of the control of th
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators Finite Lambertian source analysis of concent application to solar reflectors Finite Lambertian source analysis of concent application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoelectric stricts of CVD silicon strict	Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Results of memory of	pout in hundred kilowatt stems pout A82-11769 Some options for ports by the year 2000 pout N82-11626 stal complexes pout N82-16124 sers influencing environmental pout N82-11273 and wet oxidation as control techniques for coal pout N82-11661 of falling-jet flash put oxidation as control techniques for coal pout N82-10565 elf-mounted OTEC pulot plant d mariculture at St. Croix put of the control of th
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoelectric converters p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] GOODBAN, F. K. Use of coal cleaning for compliance with Solemission regulations [PB81-247520] GOPALAM, B. S. V. Effect of junction depth on the performance diffused n/+/p silicon sclar cell	Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Record gasifier paramet pollutant production [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-21301] GREEN, H. J. Heasured performance evaporators [DE81-024355] GREEN, H. L. Proposed 12.5 MWe she for power, water am [AIAA PAPER 81-2546] GREENMAN, P. Nonimaging concentration space GREENWOOD, J. M. The severity of insti	pout 1-hundred kilowatt pout 6 A82-11769 Some options for ports by the year 2000 pout 1 N82-11626 detal complexes pout 1 N82-16124 ders influencing environmental pout 1 N82-11273 and wet oxidation as control techniques for coal pout 1 N82-11661 of falling-jet flash put 1 N82-10565 def-mounted OTEC pulot plant defined mariculture at St. Croix put 1 N82-14011 cors for photovoltaic arrays
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMBZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors p0060 18 GOODALE, D. B. Characteristics of CVD silicon carbide thermoelectric converters p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] GOODBAN, F. K. Use of coal cleaning for compliance with some ission regulations [P881-247520] GOPALAM, B. S. V. Effect of junction depth on the performance diffused n/+/p silicon sclar cell p0056 18 GORDON, J. Solar thermal cost goals - Implementing a methodology for assessing break-even value market potential	Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Record gasifier paramet pollutant production [PB81-221301] ionic [PB81-221301] vapor-phase cracking potential pollutant gasification [PB81-213594] GREEN, B. J. Heasured performance evaporators [DE81-024355] GREEN, W. L. Proposed 12.5 MWe she for power, water an [AIAA PAPER 81-2546] GREENHAN, P. Nonimaging concentrate in space GREENWOOD, J. M. The severity of instite energy-from-municing [DE82-000133]	pout and wet oxidation as control techniques for coal pouts N82-11661 pof falling-jet flash pout of falling-jet flash cors for photovoltaic arrays pout 6 A82-11761 cors for photovoltaic arrays pout 6 A82-11761 tutional barriers affecting
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators Finite Lambertian source analysis of concent application to solar reflectors Finite Lambertian source analysis of concent application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoelectric solution solution carbide thermoelectric solution solutio	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me 82-10471 rators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-pnase cracking potential pollutant gasification [PB81-21301] GREEN, B. J. Heasured performance evaporators [DE81-024355] GREEN, B. L. Proposed 12.5 MWe she for power, water an [AIAA PAPER 81-2546 GREENMAN, P. Nonimaging concentrat in space GREENWOOD, J. M. The severity of insti energy-from-municip [DE82-000133] GREGG, D. W.	pout and the stems pout 6 A82-11769 Some options for pouts by the year 2000 pout 1 N82-11626 real complexes pout 1 N82-16124 ders influencing environmental pout 1 N82-11273 and wet oxidation as control techniques for coal pout 5 N82-11661 of falling-jet flash put 6 put 6 put 6 put 7 N82-10565 elf-nounted OTEC pulot plant 1 d mariculture at St. Croix pulot 7 N82-14011 cors for photovoltaic arrays put 6 A82-11761 tutional barriers affecting al-waste technologies pulous N82-12583
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoelectric solar terms p0060 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] p0118 18 GOODBAN, F. K. Use of coal cleaning for compliance with SOC emission regulations [PB81-247520] p0034 18 GOPALAM, B. S. V. Effect of junction depth on the performance diffused n/+/p silicon sclar cell GORDON, J. Solar thermal cost goals - Implementing a methodology for assessing break-even value market potential [AIAA PAPER 81-2550] p0054 18 GORDON, R. G.	R2-11242 Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Solar chemistry of me Solar chemistry of me PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-21301] GREEN, H. J. Measured performance evaporators [DE81-024355] GREEN, W. L. Proposed 12.5 MWe she for power, water an [AIAA PAPER 81-2546] GREENMAN, P. Of a Nonimaging concentratin space GREENWOOD, J. M. The severity of instience of the power is the	pout and wet oxidation as control techniques for coal pout techniques techniques pout techniques pour techniques
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators Finite Lambertian source analysis of concent application to solar reflectors Finite Lambertian source analysis of concent application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoelectric solution solution carbide thermoelectric solution solutio	R2-11242 Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Solar chemistry of me Solar chemistry of me PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-21301] GREEN, H. J. Measured performance evaporators [DE81-024355] GREEN, W. L. Proposed 12.5 MWe she for power, water an [AIAA PAPER 81-2546] GREENMAN, P. Of a Nonimaging concentratin space GREENWOOD, J. M. The severity of instience of the power is the	pout and the stems pout 6 A82-11769 Some options for pouts by the year 2000 pout 1 N82-11626 real complexes pout 1 N82-16124 ders influencing environmental pout 1 N82-11273 and wet oxidation as control techniques for coal pout 5 N82-11661 of falling-jet flash put 6 put 6 put 6 put 7 N82-10565 elf-nounted OTEC pulot plant 1 d mariculture at St. Croix pulot 7 N82-14011 cors for photovoltaic arrays put 6 A82-11761 tutional barriers affecting al-waste technologies pulous N82-12583
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators Finite Lambertian source analysis of concent application to solar reflectors Finite Lambertian source analysis of concent application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermolycome analyzing field test and research data describing enhanced cil recovery [DE81-030441] p0118 18 GOODBAN, F. K. Use of coal cleaning for compliance with SOC emission regulations [PB81-247520] p0034 18 GOPALAM, B. S. V. Effect of junction depth on the performance diffused n/+/p silicon sclar cell GORDON, J. Solar thermal cost goals - Implementing a methodology for assessing break-even value market potential [AIAA PAPER 61-2550] p0054 18 GORDON, E. G. Optimization of transparent electrode for socials [DE81-023359] p0063 18	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me 82-10471 Frators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-pnase cracking potential pollutant gasification [PB81-21301] GREEN, B. J. Heasured performance evaporators [DE81-024355] GREEN, H. J. Proposed 12.5 MWe she for power, water an [AIAA PAPER 81-2546 GREENMAN, P. Nonimaging concentrat in space GREENMOOD, J. M. The severity of insti energy-from-municip [DE82-000964] GREGG, D. W. Design and test of tw [DE82-000964] GREGORY, A. R. Assessment of in-place	pout a Mariera de Mariera affecting al-vaste technologies pout a Mariera affecting al-vaste technologies pout a Mariera affecting al-vaste technologies pout a Mariera affecting al-vaste pout a Mariera affecting and a Mariera affecting affecting affecting affecting affecting affecting and a Mariera affecting affecti
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSHID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide thermoenters p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] p0118 18 GOODBAN, F. K. Use of coal cleaning for compliance with SOC emission regulations [PB81-247520] p0034 18 GOPALAM, B. S. V. Effect of junction depth on the performance diffused n/+/p silicon sclar cell GORDON, J. Solar thermal cost goals - Implementing a methodology for assessing break-even value market potential [AIAA PAPEE 81-2550] p0054 18 GORDON, R. G. Optimization of transparent electrode for socells [DE81-023359] p0063 18 GORDON, W. B.	Power management of m spacecraft power sy GRAY, D. US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me Record pollutant production [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-221301] Vapor-phase cracking potential pollutant gasification [PB81-21301] GREEN, H. J. Measured performance evaporators [DE81-024355] GREEN, W. L. Proposed 12.5 MWe she for power, water an [AIAA PAPER 81-2546] GREENMAN, P. Of a [AIAA PAPER 81-2546] GREENWOOD, J. M. The severity of insting energy-from-municing [DE82-000133] GREGG, D. W. Design and test of two [DE82-000964] GREGORY, A. R. Assessment of in-place tertiary sandstones	pout a hazart stems pout 6 A82-11769 Some options for pouts by the year 2000 pout 882-11626 real complexes pout 882-16124 rers influencing environmental pout 1882-11273 and wet oxidation as control techniques for coal pout 882-11661 of falling-jet flash put 1882-11661 of falling-jet flash put 1882-10565 of falling-jet plot plant put 1882-14011 cors for photovoltaic arrays put 1882-14011 cors for photovoltaic arrays put 1882-11761 cuttional barriers affecting put 1882-12583 co-step solar oil shale retort put 1882-13543 re solution methane in texas Gulf Coast
[DE81-027961] p0101 18 GOLDHAN, J. L. Rechargeable lithium/vanadium oxide cells utilizing 2Me-THF/LiAsF6 p0154 18 GOLDSMID, H. J. Production of alloys of bismuth telluride for solar thermoelectric generators p0041 18 GOMEZ, J. M. Finite Lambertian source analysis of concent - Application to solar reflectors GOODALE, D. B. Characteristics of CVD silicon carbide therm converters p0124 18 GOODBERAD, D. T. Relational methodology for integrating and analyzing field test and research data describing enhanced cil recovery [DE81-030441] GOODBAN, F. K. Use of coal cleaning for compliance with SOC emission regulations [PB81-247520] p0034 18 GOPALAM, B. S. V. Effect of junction depth on the performance diffused n/+/p silicon sclar cell GORDON, J. Solar thermal cost goals - Implementing a methodology for assessing break-even value market potential [AIAA PAPER 81-2550] p0054 18 GORDON, R. G. Optimization of transparent electrode for socials [DE81-023359] p0063 18 GORDON, W. E. Ionospheric power beam studies	Power management of m spacecraft power sy GRAY, D. 82-15726 US energy strategies: eliminating oil imp [PB81-226052] GRAY, H. B. Solar chemistry of me 82-10471 Frators GREEN, D. A. Coal gasifier paramet pollutant production [PB81-221301] Vapor-pnase cracking potential pollutant gasification [PB81-21301] GREEN, B. J. Heasured performance evaporators [DE81-024355] GREEN, H. J. Proposed 12.5 MWe she for power, water an [AIAA PAPER 81-2546 GREENMAN, P. Nonimaging concentrat in space GREENMOOD, J. M. The severity of insti energy-from-municip [DE82-000964] GREGG, D. W. Design and test of tw [DE82-000964] GREGORY, A. R. Assessment of in-place	pout a Mariera de Mariera affecting al-vaste technologies pout a Mariera affecting al-vaste technologies pout a Mariera affecting al-vaste technologies pout a Mariera affecting al-vaste pout a Mariera affecting and a Mariera affecting affecting affecting affecting affecting affecting and a Mariera affecting affecti

GREGORY, M. EPA utility FGD (Flue Gas Desulfuriza [PB81-225773]	tion) survey p0015 N82-11679	Theoretical analysis of the Presnel function of design parameters	
GRESHO, P. H. Three-dimensional, finite elemental m	odel for	GUPTA, V.	p0059 182-16599
simulatıng heavier-than-air gaseous over varıable terrain	releases	Development of a thermodynamic prope correlation framework for the coal	
GRIPPIN, A.	p0032 N82-15602	industry, phase 1A [DE81-030363]	p0111 #82-12985
Plorida's proposed OTEC pilot plant f [AIAA PAPER 81-2563] GRIFFITH, R. W. Introduction to basic aspects of plas	P0003 A82-14021	GURUZ, K. Kinetics and mechanisms of catalytic hydroliquefaction and hydrogasific [DE81-023581]	ation of lignite p0092 N82-10144
amorphous semiconductor alloys in p conversion	photovoltaic p0039 A82-10026	GUSEV, V. K. Prospects for the development of solution of electric po	
Impurity effects in a-Si:H solar cell		thermodynamics methods	p0039 A82-10385
GRIGORIAN, IU. I. Ionization waves in an argon discharg	e in a	GUTMANN, R. J. Rectenna session: Micro aspects	-01/10 1102-12562
	p0127 A82-12666	GUYOMARD, D.	p0149 N82-12562
GRIGSBY, C. Relaxation of geothermal-reservoir st	resses	Photoelectrochemical behaviour of Cd. /liquid sodium lodide ammoniate/ j	
induced by heat production	p0105 N82-11715	Utilization in solar energy conver	
GRIL, C. n-/indium tin oxide//p-InF solar cell	- e	11	
	p0058 A82-16471	H	
GRILIKHES, V. A. Analysis of power, mass, and size par solar vapor-turbine two-circuit sys		HAACK, B. N. Net energy analysis of small wind en conversion systems	ergy
organic working bodies		-	p0121 A82-11389
GRISHUTIN, M. M. Analysis of power, mass, and size par		The effect of rotor blade thickness finish on the performance of a small	
solar wapor-turbine two-circuit sys organic working bodies		turbine [NASA-TM-82726]	p0141 N82-13114
GROSSMAN, G.	p0044 A82-11421	Wing design for light transport airc	raft with
Cycle and performance analysis of abs pumps for waste heat utilization	_	improved fuel economy	p0004 A82-14416
GROSSHANN, H.	p0103 N82-11405	HABIB-AGAHI, H. Irrigation market for solar thermal	parabolic dish
Preliminary investigation on a primar saving heat supply system for the r district "Maria Lindenhof" in Dorst	esidential	systems [NASA-CR-164955] HABBIG, J. B.	p0068 N82-11549
Germany [BMFT-PB-T-80-157] GROSVELD, F.	p0008 N82-10572	Effects of components of synfuels on [DE81-027961] HARPFLING, J.	
Establishment of noise acceptance cri	teria for	Development of a prototype of a 10 k power plant	W small solar
	p0125 A82-11825	[BMFT-FB-T-81-101] HAGEDORN, N. H.	p0080 ¥82-15532
Incremental cooling load determination direct gain heating systems	on for passive	NASA preprototype redox storage syst photovoltaic stand-alone applicati	
	p0081 N82-15575	HAGLUND, R.	p0153 A82-11774
Low cost silicon-on-ceramic photovolt	aic solar cells p0059 A82-17098	High performance solar Stirling syst. [AIAA PAPER 81-2554]	em p0061 A82-18222
Pulsed Power Research colloquium		HALE, R. R. Solar energy modulator	
GULATI, M. S.	p0150 N82-14638	[NASA-CASE-NPO-15388-1] HALL, E. H.	p0063 N82-10496
Geothermal reservoir assessment: Nor and range province Stillwater prosp		Use of coal cleaning for compliance emission regulations	
Churchill County, Nevada [DE82-000529]	p0109 N82-12516	[PB81-247520] HALL, R. A.	p0034 N82-15618
GULLICKSCH, R. L. Pulsed Power Research colloquium		Evaluation of the micro-carburetor [NASA-CR-164958]	p0016 N82-11994
[AD-A105770] GUNNICK, J. L.	p0150 N82-14638	HALLEBHAYER, R. Improvement of thermal efficiency of	flat plate
Relational methodology for integrating analyzing field test and research d		solar collectors [BMPT-PB-T-80-194]	p0075 N82-12642
describing enhanced oil recovery [DE81-030441]	p0118 N82-15508	HALSEY, J. Near-term goals for alcohol fuels from	om biomass:
GUPTA, A. Design and testing of a uniformly ill nontracking concentrator	uminating	An overview of resource requiremen environmental, and socioeconomic i. [DE81-029987]	
-	p0042 A82-11209	HAM, N. D.	
GUPTA, A. K. Flow aerodynamics modeling of an MHD combustor - Calculations and experi		<pre>Analytical evaluation of the aerodyn performance of a high-reliability wind turbine</pre>	
verification	p0127 A82-12113	HAMBERG, R.	p0134 A82-17641
GUPTA, B. K. Spectrally selective copper sulphide	•	MHD coal combustor development [AIAA PAPER 82-0380]	p0135 &82-17914

High pressure MHD coal combustors i	nvestigation,
phase 2 [DE81-027238]	p0138 N82-10888
HAMMOND, R. P.	
Experimental demonstration of the f the Mist Flow Ocean Thermal Energ	
[AIAA PAPER 81-2596]	p0136 A82-18220
HAMPSHIRE, M. J. A numerical model of a graded band	42 n
CdS/x/Te/1-x/ solar cell	yap
	p0050 A82-12817
Preparation and properties of grade CdS/x/Te/1-x/ thin film solar cel	d band gap
cus/a/le/ a/ culm rilm solar cer	p0051 A82-12818
HAN, L.	
Natural convection in air layers at ratios and angles of inclination	various aspect
	p0058 A82-16249
Formation evaluation in liquid-domi	na+od
geothermal reservoirs	mared
[DOE/ET-28384/T1]	p0109 N82-12514
HANKINS, J. D. Design, cost and performance compar	isons of
several solar thermal systems for	
Volume 1: Executive summary	-0060 NOO-11576
HANLEY, G. M.	p0069 N82-11576
Advanced Satellite Power System /SE	
HABBIFAN, M.	p0049 A82-11839
Comparison of residential window di	stributions and
effects of mass and insulation	-0047 800 40003
[DE81-027938] HANSEN, L. D.	p0017 N82-12283
Dimetryl sulfate in particulate mat	ter from coal-
and oil-fired power plants	p0005 A82-16199
HANSETH, E. J.	P0003 A02 10133
Development, solar test, and evalua	
high-temperature air receiver for parabolic dish applications	foint-focusing
[AIAA PAPER 81-2532]	p0053 A82-14003
HANSON, D. M.	n A
Development of testing procedures a	nd t to the
Development of testing procedures a bibliographic information relevan testing of solid wastes resulting	it to the
Development of testing procedures a bibliographic information relevan testing of solid wastes resulting fuels production	t to the from synthetic
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE61-030822] Development of testing procedures a	t to the from synthetic p0020 N82-12661
Development of testing procedures a bibliographic information relevant testing of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevant	t to the from synthetic p0020 N82-12661 and to the
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE61-030822] Development of testing procedures a	t to the from synthetic p0020 N82-12661 and to the
Development of testing procedures a bibliographic information relevant testing of solid wastes resulting fuels production [DE61-030822] Development of testing procedures a bibliographic information relevant testing of solid wastes resulting synthetic-fuels production [DE81-030671]	t to the from synthetic p0020 N82-12661 and to the
Development of testing procedures a bibliographic information relevant testing of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevant testing of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J.	t to the from synthetic p0020 N82-12661 and t to the from
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE61-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380]	t to the from synthetic p0020 N82-12661 and t to the from
Development of testing procedures a bibliographic information relevant testing of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevant testing of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L.	p0020 N82-12661 nd tt to the from p0021 N82-12673 p0021 N82-12673
Development of testing procedures a bibliographic information relevant testing of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevant testing of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a	p0020 N82-12661 nd t to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914
Development of testing procedures a bibliographic information relevant testing of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevant testing of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L.	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and al-carbon
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces	p0020 N82-12661 nd tt to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 absorptance and al-carbon p0040 A82-10469
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. HHD coal combustor development [AIAN PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and al-carbon p0040 A82-10469 re absorbing irmal collectors
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE61-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and Indication p0040 A82-10469 re absorbing
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and al-carbon p0040 A82-10469 re absorbing rmal collectors p0057 A82-16057
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. HHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes M.	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and al-carbon p0040 A82-10469 re absorbing rmal collectors p0057 A82-16057
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDIBG, G. L. Effect of metal base layer on the amount emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the selective absorbing surfaces HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes & Lakesbore, Indiana	p0020 N82-12661 and t to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 absorptance and al-carbon p0040 A82-10469 e absorbing rmal collectors p0057 A82-16057 water quality lational
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. HHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes Makeshore, Indiana [PB81-238479] HARKER, J. H.	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and al-carbon p0040 A82-10469 re absorbing rmal collectors p0057 A82-16057
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. HHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes Makeshore, Indiana [PB81-238479]	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and ial-carbon p0040 A82-10469 re absorbing rmal collectors p0057 A82-16057 Water quality ational p0034 N82-15624
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes Makeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O.	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and Idlar-carbon p0040 A82-10469 The absorbing From all collectors p0057 A82-16057 In water quality Internal p0034 N82-15624 p0004 A82-15589
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes Makeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O. Micro-hydropower in the United Statestick of the solid process of the solid process of the country of the solid process of the soli	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and Indication p0040 A82-10469 The absorbing From absorbing
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes Makeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O.	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and Idlar-carbon p0040 A82-10469 The absorbing From all collectors p0057 A82-16057 In water quality Internal p0034 N82-15624 p0004 A82-15589
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. HHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes M. Lakeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O. Micro-hydropower in the United State [DE81-028271] HARPER, C. M. Environmental and economic comparis	p0020 N82-12661 Ind It to the from synthetic p0020 N82-12661 Ind It to the from p0021 N82-12673 p0135 A82-17914 Ibsorptance and Ind Ind Ind Ind Ind Ind Ind Ind Ind I
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes Makeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O. Micro-hydropower in the United State [DE81-028271] HARPER, C. M. Environmental and economic comparise processes for conversion of coal	p0020 N82-12661 Ind It to the from synthetic p0020 N82-12661 Ind It to the from p0021 N82-12673 p0135 A82-17914 Ibsorptance and Ind Ind Ind Ind Ind Ind Ind Ind Ind I
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE61-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE61-030671] HARDGROVE, J. HHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the Lakeshore, Indiana [PB61-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O. Micro-hydropower in the United State [DE61-028271] HARPER, C. M. Environmental and economic comparis processes for conversion of coal into clean energy [PB81-234239]	p0020 N82-12661 Ind It to the from synthetic p0020 N82-12661 Ind It to the from p0021 N82-12673 p0135 A82-17914 Ibsorptance and Ind Ind Ind Ind Ind Ind Ind Ind Ind I
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, M. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes Makeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O. Micro-hydropower in the United State [DE81-028271] HARPER, C. M. Environmental and economic comparise processes for conversion of coal into clean energy [PB81-234239] HARRIS, J.	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and Inl-carbon p0040 A82-10469 The absorbing From absorbing From absorbing From absorbing From both to be absorbed From absorbing From collectors p0057 A82-16057 The water quality from absorbing from collectors p0034 N82-15624 p0004 A82-15589 The sor advanced and biomass p0023 N82-13256
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. HHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the Lakeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O. Micro-hydropower in the United State [DE81-028271] HARPER, C. M. Environmental and economic comparis processes for conversion of coal into clean energy [PB81-234239] HARRIS, J. Geologic considerations in undergrosystem design	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and Inl-carbon p0040 A82-10469 The absorbing From absorbing From absorbing From absorbing From both to be absorbed From absorbing From collectors p0057 A82-16057 The water quality from absorbing from collectors p0034 N82-15624 p0004 A82-15589 The sor advanced and biomass p0023 N82-13256
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the surfaces for high temperature the Lakeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O. Micro-hydropower in the United State [DE81-028271] HARPER, C. M. Environmental and economic comparis processes for conversion of coal into clean energy [PB81-234239] HARRIS, J. Geologic considerations in undergrosystem design [NASA-CR-164961]	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and Inl-carbon p0040 A82-10469 The absorbing From absorbing From absorbing From absorbing From both to be absorbed From absorbing From collectors p0057 A82-16057 The water quality from absorbing from collectors p0034 N82-15624 p0004 A82-15589 The sor advanced and biomass p0023 N82-13256
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. HHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the HARDY, H. A. Effects of coal fly-ash disposal on in and around the Indiana Dunes Makeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O. Micro-hydropower in the United State [DE81-028271] HARPER, C. M. Environmental and economic comparise processes for conversion of coal into clean energy [PB81-234239] HARRIS, J. Geologic considerations in undergree system design [NASA-CR-164961] HARRIS, J. A.	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and Indication p0040 A82-10469 The absorbing From p0057 A82-16057 Water quality Indicational p0034 N82-15624 p0004 A82-15589 The absorbing p0031 N82-15567 The absorbing p0031 N82-15567 The absorbing p0034 N82-13256
Development of testing procedures a bibliographic information relevantesting of solid wastes resulting fuels production [DE81-030822] Development of testing procedures a bibliographic information relevantesting of solid wastes resulting synthetic-fuels production [DE81-030671] HARDGROVE, J. MHD coal combustor development [AIAA PAPER 82-0380] HARDING, G. L. Effect of metal base layer on the a emittance of sputtered graded met selective absorbing surfaces Sputter etched metal solar selective surfaces for high temperature the surfaces for high temperature the Lakeshore, Indiana [PB81-238479] HARKER, J. H. Fuel and energy HAROLDSEN, R. O. Micro-hydropower in the United State [DE81-028271] HARPER, C. M. Environmental and economic comparis processes for conversion of coal into clean energy [PB81-234239] HARRIS, J. Geologic considerations in undergrosystem design [NASA-CR-164961]	p0020 N82-12661 Ind It to the from p0021 N82-12673 p0021 N82-12673 p0135 A82-17914 Ibsorptance and Indication p0040 A82-10469 The absorbing From p0057 A82-16057 Water quality Indicational p0034 N82-15624 p0004 A82-15589 The absorbing p0031 N82-15567 The absorbing p0031 N82-15567 The absorbing p0034 N82-13256

```
HARRIS, L. B.
Production of alloys of bismuth telluride for
      solar thermoelectric generators
                                                  p0041 A82-10471
   Petroleum geology and resource assessment of the
middle Caspian Basin, USSR, with special
emphasis on the Uzen field
      [DE81-029951]
   Project DEEP STEAM: Pourth meeting of the
      technical advisory panel [DE81-029457]
                                                  n0144 N82-15561
HART. K.
   User needs for solar decision-making tools: The homebuilding industry
      [DE81-027293]
                                                  p0067 N82-11325
HARTEN, L. P.

RF-driven Tokamak reactor with sub-ignited,
thermally stable operation
[DE81-029437] p0139
                                                  DO139 N82-11935
HARVEY, A. C.
   Conceptual design of 500 to 3000 hp Stirling
      engines for stationary power generation
                                                 p0123 A82-11807
    Design and development of a reciprocating
      low-temperature freon expander
      [DE81-028609]
                                                  p0023 N82-13392
HASEGAWA, H. K.
   Pire-protection research for energy technology:
      Fy 80 year end report [DE82-000970]
                                                  D0161 N82-14649
HASKINS. D. R.
   The Mt. Laguna photovoltaic project
[AIAA PAPER 82-0065]
                                                  D0061 A82-17762
HASKINS, H. J.
Small sodium sulfur battery for solar and wind
      energy systems
                                                  p0047 A82-11778
   Development of a solar receiver for an organic
      Rankine cycle engine
                                                  p0048 A82-11800
BASSAN. M.
   Distributed photovoltaic systems: Utility interface issues and their present status
      [NASA-CR-165019]
                                                  p0076 N82-13492
HASTIR, J. W.
    Mass spectrometric studies of MHD slag
      thermochemistry
      [ PB81-221434]
                                                  p0138 N82+11173
    Vaporization and chemical transport under coal
      gasification conditions
      [PB81-245839]
BASTINGS, P. C.
Status report on Central Maine Power Company's DOE
Status report of Central Maine Power Company's DOE
      Funded feasipility study of the Sears Island integrated gasification combined cycle power plant
                                                  p0089 A82-11835
HATCH, A. H.
   Magnetohydrodynamics (MHD) Engineering Test
Facility (ETF) 200 MWe power plant. Design
Reguirements Document (DRD)
      [NASA-TM-82705]
                                                  p0140 N82-12446
HAVERTY, T.
    Inexpensive thermographic techniques for
      determining reliable solar-collector-array
      performance
      [DE82-0011511
                                                  p0076 ¥82-13528
HAWAS. M.
    Calculation of the top loss coefficient by the
      network method and applications to solar
      collectors
                                                  p0056 A82-15653
HAWAS, M. M.
    A simplified method for direct calculation of the
      annual load fraction of solar systems for space
                                                  p0054 A82-14405
HANKINS, W. M.
Liquid hydrogen + An outstanding alternate fuel
      for transport aircraft
                                                  p0085 A82-17290
    Testing and evaluation of a solar photovoltaic
```

flywheel energy storage system [DOE/ET-20279/130]

p0065 N82-10558

HAYMAN, R. B.		BERBRICHT, M.	
The electric utility 4.5 MW fuel cell	power plant	Comparison of concepts for solar-hea	ted or
- An urban demonstration		solar-driven absorption and compre	
P	0131 A82-15070	machines for air conditioning and	
HAZARD, D.		preservation purposes, phase 1	
Near-term goals for alcohol fuels from		[BMFI-FB-T-81-165]	p0080 N82-15541
An overview of resource requirements, environmental, and socioeconomic impa		BRALEN, M.	C/NoT 2 2002
	0010 N82-11245	Photoelectrochemical behaviour of Cd /liquid sodium iodide ammoniate/ j	
HEAPS, J. D.	00.0 202 11243	Utilization in solar energy conver	
Low cost silicon-on-ceramic photovolta:	ic solar cells		p0051 A82-12822
	0059 A82-17098	HERHELRE, A.	-
HEDGEPETH, J. M.		Systems analysis of hydrogen/natural	gas
High performance silicon solar arrays	ewbrokind	supplementation and separation	0007 #03 45300
advanced structures	0045 A82-11758	[DE81-021383]	p0087 N82-15220
HEID, W. G., JR.	0043 A02-11738	HERTZBERG, A. Applications of power beaming from s	nace-hased
The young solar collector: An evaluati	ion of its	nuclear power stations	Pace Manea
multiple farm uses			p0145 A82-11746
	0066 N82-10577	HERTZHARK, D.	
Solar-supplemented, natural air drying	of shelled	Agricultural policies and biomass fu	
corn: The economic limitations [PB81-235681] p	0079 N82-14668	DROWED D D	p0001 A82-11542
HEIKEL, H. A.	0079 802-14000	HESTER, R. D. Improved polymers for enhanced oil r	ecover v
The effect of shielding on the aerodyna	amic	synthesis and Theology	ccovery
performance of Savonius wind turbines		[DE81-030194]	p0118 N82-15509
	0125 A82-11826	HENSON, B. W.	
BRIKEN, G.	_	Network wind power over the Pacific	
Hot dry rock geothermal prospects, 198	า 0119 N82-15559	Appendix 1: Wind statistics summa	ries for the
[DE81-025305] p(VIII 802-15559	wind power data stations [DE81-029291]	p0112 N82-13518
Photoelectrochemical behaviour of CdS/1	NaI.3.3NH3	Wind Power: Research on network win	
/liquid sodium iodide ammoniate/ junc		the Pacific northwest. Executive	
Otilization in solar energy conversion		[DE81-029360]	p0142 N82-13519
	0051 A82-12822	HEZEL, R.	
HEINE, D.		High efficiency inversion layer sola	
Development of a modular heat exchanges integrated latent heat energy store	r with	polycrystalline silicon by the appartments silicon nitride	lication of
	0160 N82-15584	SIIICON NICLIGE	p0058 A82-16127
HEINEMAND, H.		HIETABARKI, . H.	P*************************************
Chemistry and morphology of coal liques	faction	Sulfur in the air in the capital (He	lsinki)
	0095 N82-10264	metropolitan area: ITASAT-project	
HEINEMANN, P. C.		[RR-614.71]	p0025 N82-13553
Energy conservation through utilization mechanical energy storage	or	HIGGINS, C. T. Resource assessment of Low and	•
	0002 A82-11845	Moderate-temperature geothermal war	ters in
HEINISCH, H.		Calistoga, Napa County, California	
Development of a modular heat exchanger	r with	[DE81-025559]	p0109 N82-12518
integrated latent heat energy store		HILL, A. B.	
	0160 N82-15584	A numerical model of a graded band g	ap
HRITHER, K. L. Electric and hybrid vehicle environment	tal control	CdS/x/Te/1-x/ solar cell	p0050 A82-12817
subsystem study	car control	Preparation and properties of graded	
[NASA-CR-164996] pc	0020 N82-12658	CdS/x/Te/1-x/ thin film solar cell	
HEITZ, A.		,	p0051 A82-12818
Overview of active solar absorption/Ran	nkine	BILL, P. B.	_
cooling program	2000 100 46577	. Development of a metal hydride proce	
[DE81-028041] p(0082 N82-15577	hydrogen recovery from supplementer	p0086 N82-14382
Aluminum recovery from fly ash and shal	le-retort	[DE81-022685] HILL, R. P.	P4000 B02-14002
wastes		Energy technology VII: Expanding sup	plies and
	0099 N82-11154	conservation; Proceedings of the S	eventh
Kinetics of wet oxidation of biological		Conference, Washington, DC, March	
from coal-conversion wastewater treat		n toolseless HTTT. Now forth an	p0004 A82-14924
[DE82-000525] p0	0021 N82-12674	Energy technology VIII: New fuels eroof the Eighth Conference, Washington	
Study of ATES thermal behavior using a	steady flow	9-11, 1981	on, be, natem
model			p0004 A82-14925
[DE81-030883] p0)159 N82-12396	HILL, R. W.	•
HENDERSON, R. P.		Controlled Retracting Injection Point	
Low-Btu-gasifier emissions toxicology	104h NOO 446F4	system: A modified-stream method:	for in situ
[DES1-031000] p0	0014 N82-11651	coal gasification [DE81-026477]	p0102_N82-11248
Relaxation of geothermal-reservoir stre	sses	HILLS, P. J.	p0102 .802-11240
induced by heat production		Informational report on the measurement	ent and
[DE81-032024] po	105 N82-11715	characterization of diesel exhaust	
HEBRY, B. P.		[PB81-221251]	p0009 #82-11175
Cyclone performance estimates for press	surized	HISTOR, B.	
fluidized-bed combustion	1003 800-10454	Low NO sub x heavy fuel combustor con	
	1093 N82-10156	[NASA-CR-165512] HISB, B. C.	p0140 N82-12572
Economic effects induced by ESA contrac		Selective separation of coal feedstoo	ks for
2. Volume 1: Summary		conversion by magnetic separation	
	161 N82-14981	[DE81-028060]	p0108 N82-12263
•		HO, C. H.,	1
· ·		Identification and toxicity of	
, ,		fractionated-shale-oil components	

HO, P.	
'Thin foil cells - A challenge for sp designers'	ace array
-	p0049 A82-11842
HO, P. C.	
Ion exchange characteristics of enhar recovery systems (miscibility studi	
[DE81-769734]	p0096 N82-10478
HODGES, L.	
Transwall: A modular visually transmethermal storage wall	itting
[DE81-029821]	p0160 N82-15579
HORHH, P. W.	
Controlled Speed Accessory Drive demo	nstration
program [NASA-CR-165010]	p0026 N82-13981
HORHUE, K.	_
Hydrogen generation by means of catal	lyzed Mg-Al
hydrolysis	p0083 A82-10398
HOPER, D. A.	P • • • • • • • • • • • • • • • • • • •
Dynamic performance analysis for the	solar hybrid
repowering of the El Paso Electric Newman Unit No. 1	Company
nevman onic bo	p0048 A82-11802
HOPPMAN, L. C.	
Study of gelled LNG	4000
[DE81-023259] HOPPHANN, L.	p0095 N82-10269
Wind energy for the Federal Republic	of Germany
•	p0130 A82-14358
HOGAN, S.	611-
Effects of processing parameters on a inks used for solar cell front meta	
INTO GREAT TOTAL OCT TOUR MEET	P0058 A82-16474
HOHENEMSER, K. H.	-
Rotor speed control by automatic yaw:	
two-bladed wind turbines with pass: pitch variation	ive cloure
[AIAA PAPEE 81-2570]	p0129 A82-14027
Yawing of wind turbines with blade c	yclic pitch
variation [DE81-030091]	p0138 N82-11045
HOHMANN, M.	P0130 802,11043
MASEC industrial fuel-wood program	
[DE82-000461]	p0110 N82-12595
HOLDEN, M. L. Feasibility of solar assisted ethanc	l production
[AIAA PAPER 81-2533]	p0054 A82-14004
HOLDREN, J. P.	
Renewables in the U.S. energy future how fast	- HOM MACU'
now rabe	p0003 A82-14404
Intergrated assessment for energy-re-	lated`
environmental standards: A summar	y of issues
and findings [DE81-028552]	p0014 N82-11646
HOLIK. H.	P0001. 202 11010
Air circuit with heating pump	
[BMFT-FB-T-80-188] HOLLANDER, J. H.	P0017 N82-12404
Annual review of energy, Volume 6	
· -	p0001 A82-11540
HOLLANDS, K. G. 1. Optimization of flow passage geometry	. for
air-heating, plate-type solar colle	y LOE ectors
	p0055 A82-14846
HOLLOWAY, P. P.	
Comparative analyses of space-to-space power stations	ce central
[NASA-TP-1955]	p0150 N82-14202
HOLLOWAY, P. H.	1
Oxidation of electrodeposited black	chrome
selective solar absorber films	P0060 A82-17255
HOLLOWELL, C. D.	L-444 T-2 11893
Indoor air quality	
[DE81-029857]	p0033 N82-15611
HOLM, J. Turboexpanders for OTEC rower plants	*
[AIAA PAPER 81-2592]	P0003 A82-14040
HOLMAN, A. S.	• -
Selective separation of ccal feedston conversion by magnetic separation	cks for
[DE81-028060]	p0108 N82-12263
HOLTZ, M.	-
Low-cost passive-sclar retrofits for existing mobile homes	new and
	•

D0081 882-15544

[DE81-028356]

```
HOLTZ, R. B.
   Overview of DOR's large stationary Stirling engine
      development program
HOBER, M.
   Analysis of the energy impacts of the DOE
Appropriate Energy Technology Small Grants
Program: Method and results
[DE81-029844] p0028 88
                                                  p0028 N82-14651
HOPKINS, C. C.
    Technology of controlled nuclear fusion
[DE81-027361]
HOPKINS, P. M.
                                                  p0144 #82-15893
   Design and breadboard evaluation of the SPS
      reference phase control system concept
                                                  p0072 N82-12545
HOPKIBSON, J.
The new batteries
                                                  p0154 A82-13325
HOPP. W.
   Blomass energy utilization in the Pacific
      Northwest: Impacts associated with residential use of solid fuels
      [DE81-029137]
                                                  p0115 N82-14383
HOPP, W. J.

Technology assessment of solar energy systems:

Availability and impacts of woody biomass

in the Pacific Northwest
      [DE82-000705]
                                                  p0024 N82-13535
HORNSTRA, P.
   Near-term batteries for electric vehicles
      [DE81-023543]
                                                  p0157 N82-10556
HORSTNANN, H.
    A central microprocessor controlled electrical
      storage heating system
      [BMFT-FB-T-80-182]
                                                  p0025 N82-13547
HORTON, W. S.
    Vaporization and cnemical transport under coal
      gasification conditions
      [PB81-245839]
HORVATH, E.
   The transformation of wind energy by a high
altitude power plant /HAPP/
[ATAM PAPER 81-2568] p0128 A82-14

HOSTETLER, L. D.

Design, cost and performance comparisons of several solar thermal systems for process heat.
                                                  p0128 A82-14025
      Volume 1: Executive summary
      [DE81-029881]
                                                  D0069 N82-11576
HOUSEMAN, J.
    ISEMENT, U.
Assessment of advanced coal gasification processes
[NASA-CE-164949] p0098 N82-11146
BOUSER, G.
    Sampling and analysis of potential geothermal sites
      [PB81-240061]
                                                  p0119 N82-15593
BOUSER, T.
Fundamentals of mitric oxide formation in
      fossil-fuel combustion
      [DE81-030329]
                                                  p0033 N82-15608
HOVE, D.
    OTEC ocean system development
[AIAA PAPER 81-2590]
                                                  p0130 A82-14038
HOWRLL, W. R.
One viewpoint concerning unit size in the
      development of wind turbines
                                                  p0131 A82-14845
HRABAK, B. A.
    Site And Neighborhood Design (SAND): Development of simplified automated building thermal load
      procedures, phase 1 [DE81-027138]
HRISHIKBSHAN, D. S.
    Optimization of heat losses in normal and reverse
      flat-plate collector configurations - Analysis
      and performance
                                                  p0059 A82-16744
BSIBH, B. C. B.
Enthanol fuels from biomass projects
                                                   p0089 A82-11837
BUANG, H. S.
    Economic and environmental tradeoffs in coal
      conversion
      [CONF-800608-8]
                                                  p0009 N82-10598
    Preliminary evaluation of advanced coal-based
      electricity-generating technologies by means of
      system-integration analysis
      [DE81-029989]
                                                  p0105 N82-11573
```

HOB, K. A.		ILES, P. A.	
Analysis of potential cogeneration i electricity generation by the Cent		'Thin foil cells - A challenge for s designers'	space array
Power Company			p0049 182-11842
[DE81-029991] HUDSON, W. R.	p0028 N82-14650	Silicon solar cell process developme fabrication and analysis	ent,
Advances in space power research and the National Aeronautics and Space		fabrication and analysis [NASA-CR-163787] INAL, O. T.	p0063 N82-10500
-	p0122 A82-11755	Introduction to the role of crystal	
HUPP, J. B. Design considerations for vehicular	fuel cell	solar materials	p0037 A82-10009
power plants		Characterization of selective solar	
[DE81-769737] HOPPMAN, P. D.	p0138 N82-10961	microstructures - Electron microso	ope studies p0060 A82-17254
Characteristics of CVD silicon carbi	de thermionic	INGRESOLL, J.	-
converters	p0124 A82-11821	Potential energy savings in the resi of the United States	idential sector
HUPPAGEL, H.	•	[DE81-028873]	p0028 N82-14662
Development of organic geochemical a techniques for hydrocarbon explora		INGRAM, R. L. Peat deposits of Dismal Swamp pocosi	ns. Camden.
	p0097 N82-10482	Currituck, Gates, Pasquotank, and	
HULL, J. B.		Counties, North Carolina	-0100 NO3-1353#
Transwall: A modular visually trans thermal storage wall	mitting	[DE81-029642] IRWIN, J. C.	p0109 N82-12524
[DE81-029821]	p0160 N82-15579	Investigation of the performance of	
HUMMER-MILLER, S. Geologic applications of thermal-ine	rtia manning	MoS2/I-/I2/C electrochemical solar	; cell p0053 A82+13805
from satellite	reid mapping	IRWIN, R. B.	p0033 202 .3003
	p0118 N82-15489	The effect of concentrator field lay	
HUNN, B. D. Long-term performance of the Hunn pa	ssive solar	BE-1 small community solar power s	p0048 A82-11799
residence		ISAACSON, R.	
[DE81-028735] Ultimate in building energy analysis	p0070 N82-11600 : DOR-2 and	Advanced system experimental facilit waste to methane gas. Background	
BLAST	p0023 N82-13263	description [DE81-030198]	p0101 N82-11244
HUSSRINY, A. A.		ISHII, K.	- ,
Introduction of sclar energy in Saud case study	1 Arabia - A	Energy analysis for a sample building proposed ASHRAB simplified method	
HUTCHBY, J. A.	p0056 A82-15660	[DE81-027189] ISHIKAWA, M.	p0012 882-11323
The development of high efficiency c	ascade solar	Two-dimensional effects in power tak	
cells - An overview	p0047 A82-11794	[DE82-000091] ISLER, R. J.	p0141 N82-13367
HUTCHIBSON, P.	-	Coal-oil mixtures: An alternative f	
The Lea county electric 100-kilowatt grid-connected photovoltaic system		commercial markets and large resid [DE81-028335]	p0114 N82-14379
[AIAA PAPRE 82-0067]	p0061 A82-17764	ISHANZHANOV, A.	•
HWANG, H. L. Research activities of solar cells i.	n ROC	Investigation of abrasive action of particles on the reflectance of mi	
	p0047 A82-11795		p0040 A82-10388
HYDER, A. K. Pulsed Power Research colloquium		ISSER, S. Energy end-use requirements in manuf	acturing
[AD-A105770]	p0150 N82-14638	volume 1	accurray,
HYNEK, S. J.		[DE81-028975]	p0064 N82-10512
Design and development of a reciproc- low-temperature freon expander	ating	Energy end-use requirements in manuf volume 3	acturing,
[DE81-028609]	p0023 N82-13392	[DE81-027976]	p0007 N82-10544
HYSON, P. The annual variation of atmospheric	co3	IULIN, H. K. Jet fuel from carbon	
concentration observed in the Nort	hern Hemisphere		p0090 A82-12021
	p0002 A82-12156	IVENTEVA, O. O. Gallium-arsenic-antimony heterojunct	ion photocolle
1 ,		oulling discuss dutinony necessifunce	p0055 A82-14667
•		IVETT, G. Modelling of the detectron Plundune	
IANNUCCI, J. J. Design, cost and performance compari.	sons of	Modelling of the jet-stream Fluidyne	p0124 A82-11812
several solar thermal systems for		IWASAKI, B.	
Volume 1: Executive summary [DE81-029881]	p0069 N82-11576	An active alignment scheme for the M	PTS array P0147 N82-12541
IGHATIEV, A.		IWATA, H.	-
The optical properties-microstructur- in particulate media - Optical tai solar absorbers		MHD coal combustor development [AIAA PAPER 82-0380] High pressure MHD coal combustors in	p0135 A82-17914 vestigation,
IIDA, B.	p0037 A82-10011	phase 2 [DE81-027238]	p0138 N82-10888
A LE2 engine fuel system on board -		IYER, J. V.	-
injection into two-stroke engine w. [ASME PAPER 81-ET-81]	1th LH2 pump p0083 A82-10966	Spectrally selective copper sulphide	coatings p0040 A82-10468
IKPAH, A. O.	_	IZU, H.	-
Oil and gas industry and environments Application of systems reliability		Progress in large area photovoltaic on amorphous silicon alloys	uevices dased
the evaluation of the status of en pollution control in the Nigerian industry	vironmental		p0049 A82-11855
	-0000 805 40503		

p0008 N82-10583

J	
JACOB, H. Development of organic geochemical ar	id isotope
techniques for hydrocarbon explorat	ion
[BHFT-FB-T-80-076] JACOBS, B. W.	p0097 N82-10482
Cost estimates for advanced/innovative conversion systems /AWECS/	e wind energy
[AIAA PAPER 81-2557]	p0128 A82-14016
JACOBSON, D. L. Perrormance of a cylindrical phase ch	ange thermal
energy storage unit [AIAA PAPER 82-0076]	p0155 A82-17770
JAEGRR. P.	-
Hydrogen generation by means of catal hydrolysis	
JAPPE, L. D.	p0083 A82-10398
Secondary concentrators for parabolic thermal power systems	: dish solar p0048 A82-11798
Dish concentrators for sclar thermal	
Status and technology development [AIAA PAPER 81-2530] Secondary and compound concentrators	p0053 A82-14001 for parabolic
<pre>dish solar thermal power systems [NASA-CR-164960]</pre>	p0068 N82-11550
JAIN, G. C. Grain size dependence of the photovol	taic
properties of solar grade polysilic	on
JAIN, M. L.	p0057 A82-16051
Assessment of the potential of coal- engines in total and integrated en	Eueled heat ergy systems
[DE82-000169] JAIN, R.	p0018 N82-12587
Controlled-flash pyrolysis	-0444 702 42400
[DE82-000284] JAKUBOWSKI, A.	p0111 N82-13196
Temperature dependence of the short-of current in MIS solar cells	circuit
JANDEGIAN, G. V.	p0052 A82-12825
A computer simulation modeling study air quality impacts from a 500 MW of	to predict coal-fired
power plant	p0020 N82-12650
JANKA, R. C. Process development for improved SRC.	
Kerr-McGee critical sclvent deashir fractionation studies	ng and
[DE81-903785]	p0114 N82-14380
JARASS, A. Wind energy for the Federal Republic	of Germany p0130 A82-14358
JARASS, L. Wind energy for the Federal Republic	of Germany p0130 A82-14358
JARVINER, P. O. Testing and evaluation of a solar pho	otovoltaic
flywheel energy storage system [DOB/ET-20279/130]	p0065 N82-10558
JATAR, S.	-
Investigations on a Se-CdO photovolta	p0132 A82-16052
JAYADEV, T. S. Applications of thermoelectrics to ge	othermal
energy conversion	p0125 A82-11824
JEFFREY, P.	_
National photovoltaic program in amou [DE81-025906] JENSEN, J. E.	p0070 N82-11609
Cryogenic testing of 100-m superconductransmission test facility	cting power
[DE81-028331] JENSEN, R. N.	p0150 N82-13517
Design of an energy conservation bull	
[NASA-TH-83175] JOHANSSON, B. C. A.	p0027 N82-14632
A two-dimensional study of the maximu can be obtained from a wind turbine	m power that in a wind
shear layer [FFA-134]	p0140 N82-12537
JOHN, R. S. Value tree analysis of energy supply	-
Address of the analysis of energy subbit	CT CCT HO CT AGO

p0029 N82-14875

[AD-A105629]

```
JOHNSON, D. C.
    Jet impingement heat transfer enhancement for the
      GPU-3 Stirling engine [NASA-TM-82727]
                                                 p0140 N82-11993
JOHNSON, D. H.
Measured performance of falling-jet flash
      evaporators
      [DE81-024355]
                                                  p0161 N82-10565
JOHNSON, D. R
   Project DEEP STEAM: Pourth meeting of the
      technical advisory panel
      [DE81-029457]
                                                  D0144 N82-15561
JOHNSON. E. L.
    The Texas Instruments Solar Energy System
      development
                                                  D0047 A82-11773
JOHNSON, G. R.
Effects of atmospheric variability on energy
      utilization and conservation
      [DE81-026308]
JOHNSON, I.
   Studies of the regeneration of activated bauxite
      used as granular sorbent for the control of
      alkali vapors from hot flue gas of coal combustion [DE81-030192] p0008 N82-10590
JOHNSON, M. M.
Mississippi County Community College solar
      photovoltaic project
      [DE81-030669]
                                                  p0068 N82-11554
JOHNSON, T.
    Problems and potential for MHD retrofit of
      existing coal-fired plants
      [AIAA PAPER 81-2586]
                                                  p0130 A82-14036
JONES, G. J.
   Solar photovoltaic system engineering perspectives
      [DE81-023179]
                                                  p0066 N82-10570
JONES, M. H.
   Chemical element concentrations in liquids and solids associated with power plants using FGD
      systems
      [DE81-030422]
JONES, H. S., JR.
Proposed 12.5 NWe shelf-mounted OTEC pilot plant
      for power, water and mariculture at St. [AIAA PAPER 81-2546] p012
                                                  p0127 A82-14011
JONES, N. S.
    Symposium proceedings: Environmental aspects of
      fuel conversion technology, 5th [PB81-245045]
                                                  DQ034 N82-15623
JONES, R. F.
Comparative thermal performance of direct gain,
      Irombe, and sunspace walls [DE81-030546]
JONES, S. C.
   Irrigation market for solar thermal parabolic dish
      systems
      INASA-CR-1649551
                                                  p0068 N82-11549
JONES, W. H.
Use of oxide decompositions in advanced
      thermochemical hydrogen cycles for solar heat
      sources. Application of the tricobalt tetraoxide-cobalt monoxide pair [DE81-030235] p00
                                                  p0082 N82-15581
JUDA, W.

Energy savings by means of fuel-cell electrodes in electro-chemical industries

p0018 N82-125
                                                  p0018 N82-12582
JUDD, B. R.
   Evaluating R and D options under uncertainty.
Volume 2: Atmospheric fluidized-bed combustion
      commercialization strategies
      [DE81-904246]
                                                 p0035 N82-16012
   Evaluating R and D options under uncertainty.
      Volume 3: An electric-utility
      generation-expansion planning model
      [ DE81-9042371
                                                 p0035 N82-16013
JUNG, H.
   Energy storage systems for terrestrial solar
      generators
      [BMFT-FB-T-81-082]
                                                  p0080 N82-15529
JUNKIN, P. D.
Environmental research plan for gas supply technologies. Volume 1: Executive summary p0015 N8
                                                 p0015 N82-11657
JUROSĒBE, J. R.
   Bffects of the Satellite Power System on low Earth orbit and geosynchronous satellites [PB81-232019] p0150 N82-131
                                                 p0150 N82-13157
```

KATZER, J. R.

84

KALEMA, T. The properties of solar and heat pump heating systems of small houses and additional heat sources [VTT-56] p0075 882-12644 KALENDA, H. Assessment of potential future markets for the production of hydrogen from water [BMFT-FB-T-81-012] p0086 N82-12266 KALHAN, M. D. Investigation of direct expansion in ground source heat pumps [DE81-024139] p0012 B82-11418 KALTER, R. J. Bthanol production in southern tier east region of New York: Technical and economic feasibility [PB81-226979] p0011 B82p0011 N82-11275 KALVINSKAS, J.

Coal desulfurization by low temperature chlorinolysis, phase 3

[NASA-CR-164957] p0 D0098 N82-11145 KALVIESKAS, J. J.

Bydrodesulfurization of chlorinated coal p0107 N82-12240 [NASA-CASE-NPO-15304-1] RAMATH, G. S.
GaAs solar cells for space application p0046 A82-11766 KAMIBSKY, P. C. Implementation of a siting methodology for utility size WECS in western Massachusetts and northwestern Connecticut [AIAA PAPER 81-2540] p0091 A82-14008 KAMBERUD, R. Incremental cooling load determination for passive direct gain heating systems
[DE81-029882] p006
Verification of BLAST by comparison with p0081 N82-15575 measurements of a solar-dominated test cell and a thermally massive building [DE81-029883] p0082 N82-15578 KANDPAL, T. C. Geometrical cptical performance studies of a composite parabolic trough with a fin receiver p0043 A82-11390 Energy programs at the johns hopkins university Applied Physics Laboratory [PB81-218141] p0013 N82-11535 KANNBERG, L. D. Compressed-air energy-storage technology: Program [DE81-030103] p0160 N82-15548 KANTROWITZ, M.
User needs for solar decision-making tools: The homebullding industry [DE81-027293] p0067 N82-11325 Boiling flow instability of a fixed mirror distributed focus solar receiver D0041 A82-10810 KAPLAH, S. I. Startup experience with a concentrating photovoltaic power system [AIAA PAPER 82-0068] p0061 A82-17765 KAPOGR, V. J. Multijunction high voltage concentrator solar cells p0047 A82-11796 KARPENKO, A. M. Prospects for the development of sclar energy in the USSR Production of electric power by thermodynamics methods p0039 A82-10385 RASCHUBE, H.

Preliminary investigation on a primary energy saving heat supply system for the residential district "Maria Lindenhof" in Dorsten, West Germany [BMPT-PB-T-80-1571 D0008 N82-10572 KASUDĀ, T. Energy analysis for a sample building by the proposed ASHRAE simplified method [DE81-027189] p0012 N82-11323 KATS, E. IU. Photoanode on the base of pheophytin-sensitized reactions D0059 A82-16742

Development of superior denitrogenation and isomerization catalysts for processing crude oil derived from shale, part 1 [AD-A105667] p0113 N82-14317 KAUPMAN, A. Develop and test fuel cell powered on-site integrated total energy system. Phase 3: Pull-scale power plant development [NASA-CR-165328] KAUSHIK, N. D. Thermal analysis of three zone solar pond p0054 A82-14406 KAUSHIK, S. C. A novel latent heat storage for solar space heating systems - Refrigerant storage p0043 A82-11386 KAVANAUGH, J. P. Cost goals for a residential photovoltaic/thermal liquid collector system set in three northern locations [DB81-029700] p0073 N82-12610 KAWAOKA, K.
Near-term goals for alcohol fuels from biomass: An overview of resource requirements, land use, environmental, and socioeconomic impacts p0010 N82-11245 [DE81-029987] EAWLH, B. A.
Bibliography of the seasonal thermal energy storage library [DE81-030470] p0159 N82-12586 Analysis of the energy impacts of the DOE Appropriate Energy Technology Small Grants Program: Method and results [DE81-029844] p0028 N82-14651 Space chamber experiments of ohmic heating by high power microwave from the Solar Power Satellite p0145 A82-16991 KAZMERSKI, L. Introduction to photovoltaics - Physics, materials and technology p0038 A82-10022 Research and device problems in photovoltaics p0039 A82-10023 KAZMERSKI. L. L. Advances in photovoltaics R&D - An overview p0047 A82-11793 Effects of heat treatment on epitaxial silicon solar cells on metallurgical silicon substrates p0058 A82-16469 KRARDBY, D. W. Industrial process heat applications for solar thermal technologies [DE81-025934] p0081 N82-15545 RELLEY, P. A.

Pyrolytic characterization of the organic matter in selected coals and in the Devonian shales of southern West Virginia p0113 N82-13578 KELLY, T. Plorida's proposed OTEC pilot plant for Key West
[AIAA PAPER 81-2563] p0003 A82-1 p0003 A82-14021 KELH, G. G. Test results and facility description for a 40-kilowatt stirling engine INASA-TH-826201 p0141 N82-13013 KELSEY, J. R.
Accessing the geothermal resources [DE81-025396] p0116 N82-14614 Sandia program in geothermal technology development [DE81-025394] p0119 N82-1554 p0119 N82-15546 REMP, N. B.
Pulverized-fuel combustion: Modeling and scaleup methodologies [DE81-026546] p0093 N82-10158 KENARANGUI, R. Introduction of solar energy in Saudi Arabia - A case study D0056 A82-15660 KENTPIBLD, J. A. C.
A vertical axis cyclogiro type wind-turbine with freely-hinged blades p0125 A82-11829 KEPPLER, H. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 N82-11715

KERNIN, B. M.		.
Antenna optimization and cost consider the Solar Fower Satellite microway	eration e syste	IOI M
		A82-11744
KESAVAE, K. Brayton cycle using dissociating nit:	cosyl c	hloride
		A82-11852
<pre>RESSEL, J. Analysis of the energy impacts of the</pre>	e DOE	
Appropriate Energy Technology Small Program: Method and results		s
[DE81-029844]	p0028	N82-14651
KESTIN, J. Plow in geothermal wells. Part 4: !	Tranc:+	ion
criteria for two-phase flow patters	n s	
[DE81-028312] Analysis of thermal/mechanical energy	p0096	N82-10366
concepts		
[DE81-027854] KEYDEL, W.	p0139	N82-11585
Microwave power transmission by sate		
KHALAFALLAH, M. G.	p0145	A82-12503
The effect of shielding on the aerod	ynamic	
performance of Savonius wind turbin		A82-11826
KHALIPA, H. B.	•	
The economic implications of the exerthermal efficiencies of energy con-	rgy and Version	svstems
		A82-11702
KHOI, P. V. Some characteristics of silicon photo	ocells	
fabricated by planar technology		.00 40204
KIBBRY, A. H.	50039	A82-10386
Low-level radioactive waste: An int	roducto	ıry
overview [DE81-026334]	p0022	N82-12924
KIDNAY, A. J	14 - 14	
[DE81-029481]		N82-10939
KIESSLING, F. Calculation of natural modes of wibra	stion f	for
rotor blades by the finite element	method	ļ
[DFVLR-FB-81-07] ; KIH, A. G.	p0136	N82-10452
Creating a safer environment in US co		
The Bureau of Mines Methane Contro.	l Progr	am,
[PB81-233918]	p0112	N82-13488
KIH, S. S. Controlled-flash pyrolysis		
[DE82-000284]	p0111	N82-13196
KINDLE, C. H. Techniques for geothermal liquid sam	pling a	.nd
analysis		
[DE81-030151] KING, D. M.	-	N82-11149
Mechanical energy storage technology	projec	t 182-10500
[DE81-029753] KIRCHHOFF, R.	_	N82-10508
Yaw dynamics of a horizontal axis win		11e . 182-17637
KIRCHHOFF, R. H.	-	
Implementation of a siting methodolog size WECS in western Massachusetts		utility
northwestern Connecticut		
[AIAA PAPER 81-2540] KIRKHAN, H.	p0091	182-14008
Control of new energy sources in an	electri	.c
utility system	p0154	A82-13082
KIRNER, E.	-	
Technological activities for high per receivers	riorman	ce
[BMFT-FB-T-80-133]	p0066	N82-10571
KISELEV, B. A. Photoanode on the base of pheophytin-	-sensit	ized
reactions		
KIVAISI, R. T.	P 0059	182-16742
Optical properties of selectively ab-		
chromium films deposited at oblique	e andre	. OT

p0040 A82-10467

p0093 N82-10249

incidence

Chemistry of lignite liquefaction
[DE81-030178]

KLABUNDE, K. J.

Fuels from biomass and wastes p0091 A82-14986 Energy consumption analysis and comparative study of the operational results from heat pump plants [BMFI-FB-T-80-109] p0032 N82-15583 KLEBNAN, P. I. Modeling energy-conservation potentials of community energy-system technologies [DE81-026059] p0013 p0013 N82-11589 RLBIB, J.

Distributed photovoltaic systems: Utility
interface issues and their present status
p0076 p0076 N82-13492 KLBIN, J. A. Control of hydrocarbons and carbon monoxide via catalytic incineration [DE82-000508] D0025 N82-13560 KLRINHAN, M. H. Present status of Florida Power Corporation's D.O.E. funded feasibility study of the Higgins plant repowering/coal gasification project p0089 A82-11834 Application of large and small wind turbine generators - A utility perspective p0133 A82-17629 KLOSEK, J. Cryogenic methane separation/catalytic hydrogasification process analysis p0093 N82-10152 [DE81-029123] KLYCHBV, SH.: I. Efficiency of selective surfaces for solar thermal collectors p0044 A82-11425 KNAPPERT, D. R. Partial acid hydrolysis pretreatment for enzymatic hydrolysis of cellulose: A process development study of ethanol production D0107 N82-12236 Electrodes and diaphragms for fuel cells [BMFT-FB-T-81-047] p0143 N82-14666 KOBAK, J. A.

Lewis Research Center's coal-fired, pressurized, fluidized-bed reactor test facility [NASA-TM-81616] p0103 N82-11397 KOBAYĀSHI, Y. A LH2 engine fuel system on board - Cold GH2 injection into two-stroke engine with LH2 pump [ASME PAPER 81-HT-81] p0083 A82-1 p0083 A82-10966 ROCK, J.

Development of organic geochemical and isotope [BMFT-FB-T-80-076] p0097 N82-10482 KOECHBER, W. Technical and economic assessment of solar thermophotovoltaic conversion [DE81-803762] p0064 N82-10515 KOBHLER, D. B. Performance characteristics of automotive engines in the United States, third series: 1977 Chrysler 318 CID (5.21), 2V Г РВ8 1-2330 251 p0023 N82-13435 KOBLLE, D. E. Transportation systems and cost comparison for launching an SPS into geosynch. orbit P0050 A82-12507 KORNIG, B. A.
Low-to-moderate temperature geothermal resource assessment for Nevada, area specific studies [DE81-030487] p0096 N82-10475 KORPKE, B. G. Low cost silicon-on-ceramic photovoltaic solar cells p0059 A82-17098 KOESTER, J. K.
Advances in coal fired MHD generator research p0126 A82-11853 Experimental investigation of parabolic-cylinder solar concentration with tubular heat receiver p0040 A82-10389 KOLTUB, M. M.
Present state of research on selective coatings for solar-energy converters p0039 A82-10387

KLASS, D. L.

KREMBR. F. Combined solar-energy converters with selective Enhancement of methane gas production using an coatings P0044 A82-11424 KONSTABTIBOVSKII, IU. A. Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 EOPPE, R. H.
Potential contribution of currently operating nuclear-fueled electric-generating units to reducing US oil consumption [DE81-030497] p0031 N82-15553 KORDESCH, K. V.

Design of a cell for electrode kinetic
investigations of fuel cell reactions p0136 A82-18394 Thermal deformation of concentrators in an antisymmetric temperature field D0062 A82-18698 KOSMARL, H. G.
Analytic investigation of efficiency and performance limits in klystron amplifiers using multidimensional computer programs; multi-stage depressed collectors; and thermionic cathode life studies p0148 N82-12553 KOSTOFF, R. B. Possible application of electromagnetic guns to impact fusion D0135 A82-18201 KOSTRZEWA, S.
Gas cooled solar power plant for generating electrical energy in the 20HWe operating range (GAST): Preliminary design phase [BMPT-F6-T-81-097] D0080 N82-15530 KOWE, B. T. Environmental and economic comparison of advanced processes for conversion of coal and biomass into clean energy [PB81-234239] p0023 N82-13256 KOZAKOFF, D. J. Considerations for high accuracy radiation efficiency measurements for the Solar Power Satellite (SPS) subarrays p0148 N82-12559 KOZLOV, IU. H. Photoanode on the base of pheophytin-sensitized reactions p0059 A82-16742 KRAADEL, J. S.

The effect of variable fluid properties on scale modeling D0049 A82-12269 KRAJEWSKI, R. P. Plane-retention head burner efficiency test results and analysis: Space-heating-equipment test program [DE81-0302191 p0093 N82-10153 KRAMLICH, J.
Soot formation in synthetic fuel droplets [DE81-028391] p0092 N82-10150 KRANIČH, W. L. Kinetics and mechanisms of catalytic hydroliquefaction and hydrogasification of lignite [DE81-023581] P0092 N82-10144 KRAUS, K. A. Ion exchange characteristics of enhanced oil recovery systems (miscibility studies) [DE81-769734] p0096 N82-10478 KRAUSE, P. C.
Security assessment of power systems including energy storage and with the integration of wind energy [DE81-030166] p0140 N82-12590 KRANCZYK, S. K. Temperature dependence of the short-circuit current in MIS sclar cells p0052 A82-12825 KRAWIEC. P. Energy end-use requirements in manufacturing, volume 1 f DE81-028975 1 p0064 N82-10512 Energy end-use requirements in manufacturing, volume 3 [DE81-027976] D0007 N82-10544 KREINER, D. M.

Ceramics for the AGT101 automotive gas turbine

p0132 A82-16827

industrial waste in anaerobic digestion [DB81-023819] p0095 N82-10267 KREMER, G. Process for removing sulfur oxides from gases with direct production of a usable finished reaction product [BMFT-FB-T-81-102] p0029 N82-15142 KRICHKO, A. A. Jet fuel from carbon p0090 A82-12021 KRILL, W. V.

Kinetics of NO/ sub x formation during early stayes of pulverized-coal combustion p0014 N82-11641 [DE81-029071] KRISHMAN, R. P. Tennessee Valley Authority atmospheric fluidized-bed combustor simulation [DE81-0302621 p0098 N82-11151 KRISHDASUANY, S. F. Controlled cadmium telluride thin films for solar-cell applications [DE81-023275] p0066 N82-10569 KRISHBR, B. Development of a process for recovery of valuable components from complex hydrodesulfurization catalysts especially tungsten, molybdenum, vanadium, nickel and cobalt [BMFT-FB-T-80-186] p0016 N82-12204 KRISTIANSER, M.
Pulsed Power Research colloquium
[AD-A105770] p0150 N82-14638 KRON, A. J. Hot dry rock geothermal prospects, 1981 [DE81-025305] p0 p0119 N82-15559 KUBO, L. H. Assessment of flywheel system benefits in selected vehicle applications
[DE81-025976] p0158 N82-1199 p0158 N82-11997 KUDIRRA, A. A.

Use of ceramics in point-focus solar receivers
[AIAA PAPER 81-2552] p0054 A82p0054 A82-14015 KULKARNI, S. V.

Mechanical energy storage technology project [DE81-029753] p0155 N82-10508 Plywheel rotor and containment technology development [DE81-0280471 p0159 N82-14655 KULSHRESHTHA, A. P. Theory of back surface field silicon solar cells p0056 A82-15447 KUMAR GUPTA, P. Efficiency of Fresnel lenses p0043 A82-11387 KUMAR, K. H. Development of a thermodynamic properties correlation framework for the coal conversion industry, phase 1A [DE81-030363] p0111 N82-12985 KUMAR, K. S. Model based studies of some optical and electronic properties of narrow and wide gap materials D0062 A82-18471 KUNAR. S. Design and testing of a uniformly illuminating nontracking concentrator p0042 A82-11209 KUMARI, S. Grain size dependence of the photovoltaic properties of solar grade polysilicon p0057 A82-16051 KURBOWSKI, T. L. Performance predictions of passive solar commercial buildings [DE81-027979] p00 p0079 N82-15247 KURTZ, J. User needs for solar decision-making tools: The homebuilding industry [DE81-027293] p0067 N82-11325 KUTCHER, H. R.
Alcoa vertical axis wind turbines p0133 A82-17628 KUTSCHER, C. P. Application of solar thermal energy to buildings and industry [SERI/TP-641-1222] p0066 N82-10563

KWAN, Y.	lmanlaka
Soot formation in synthetic fuel of [DE81-028391]	p0092 N82-10150
KWART, H. Development of superior denitroger	nation and
isomerization catalysts for proc	
derived frcm shale, part 1 [AD-A105667]	p0113 N82-14317
KYLE, S.	learing Walnes
Energy and development in Central 1: Regional assessment	America. Volume
[PB81-231540] Energy and development in Central	p0032 N82-15589
2: Country assessments	
[PB81-231557]	p0032 N82-15590
L	
LA ROTONDA, L.	
A simplified model of the thermohy behaviour of a linear collector	
conversion of the solar energy	
LACHISH, U.	p0062 A82-18816
Photoelectrochemical cells using pand thin film MoS2 electrodes	polycrystalline
	p0057 A82-16053
LACKEY, M. B. Coal and limestone feed testing for	or atmospheric
fluidized bed combustion [DE81-030629]	p0117 N82-15222
LACORTI, A. B.	-
Halogen acid electrolysis in solid electrolyte cells	1 polymer
LADELPA, C. J.	p0084 A82-16346
Production of synthetic crude oil	from coal using
the TOSCOAL pyrolysis process	p0090 A82-11849
LADELFE, C. H. Hot dry rock geothermal prospects,	1981
[DE81-025305]	p0119 N82-15559
LAEGREID, M. M. Treatment of blomass gasification	wastewaters
using reverse osmosis [DE82-000698]	p0025 N82-13566
LAGERKVIST, K. O.	_
Aging and corrosion problems with energy absorbers. Study based up	flat solar pon literature
and experiment exchanges [SP-RAPP-1979/4]	p0077 N82-13548
LAKE, M. R.	•
Sputter etched metal solar select: surfaces for high temperature th	
LAKSHMANAN, S.	p0057 A82-16057
Fuels and chemicals made from sola	
[DE81-025018] LAMB, J. L.	p0077 N82-14384
Sputter-deposited Al203/Mo/Al203 a absorber coatings	selective .
-	p0060 A82-17253
LAMONTAGHE, J. Role of large scale energy systems	s models in R&D
planning [DE81-026058]	p0031 N82-15543
LAMPERT, C. M.	-
Metallurgical analysis and high to degradation of the black chrome	
absorber	p0060 A82-17252
LANDER, H. R. Jet fuel locks to shale oil: The	-
review	
[AD-A104414] LANDGREBE, A. R.	p0100 N82-11228
Review of electrochemical energy of	conversion and
storage for ocean thermal and wa	p0126 A82-11832
LANDSBERG, H. H. Pactors in the development of a ma	nior US synthetic
fuels industry	-
LANDSHAN, D. A.	p0001 A82-11543
Investigation of the in-situ oxida in fuel cells	ation of methanol

p0143 N82-14642

[AD-A105947]

LANE, K. R. Construction of a recycled Portland cement concrete pavement [PB81-233553] p0023 N82-13267 LANG. K. Energy end-use requirements in manufacturing, p0064 N82-10512 [DE81-028975] Energy end-use requirements in manufacturing, volume 3 [DE81-027976] LANGLAND, R. T. Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification p0015 N82-11712 [DE81-027131] LANSING, F. L.
An optimization model for energy generation and distribution in a dynamic facility p0011 N82-11310 A protective additive for jet fuels D0090 A82-12022 LARKO, D. Spectra over complex terrain [DE81-028734] p0112 N82-13473 LARUEDETOURNEMINE, R. Economic effects induced by BSA contracts, phase
2. Volume 1: Summary
[ESA-CR(P)-1462-VOL-1] p0161 N82-14 p0161 N82-14981 LATER, D. W. Dimethyl sulfate in particulate matter from coaland oil-fired power plants p0005 A82-16199 LATTA. R. Exploring the variability in energy consumption (DE81-029910) p0018 N82-12 D0018 N82-12589 LAUGHLIN, A. W.

Hot dry rock geothermal prospects, 1981
[DE81-025305] p0 p0119 N82-15559 LAVAINB, P. Theoretical and numerical resolution of a mathematical model of the release of solar energy from storage p0061 A82-18232 LAWLESS, J. L., JR.

The plasmadynamics and ionization kinetics of thermionic energy conversion p0137 N82-10494 LAWRENCE, J. D.
Innovative equipment for small-scale hydro developments p0141 N82-12634 [DE81-027820] GRAD: A tool for program analysis and progress monitoring p0120 N82-15981 F DE81-0280981 LAY, R. K. US energy strategies: Some options for eliminating oil imports by the year 2000 p0014 N82-11626 [PB81-226052] LAYTON, J. P. Nuclear reactor closed Brayton cycle space power conversion systems p0126 A82-11840 A solar heating system with annual storage p0056 A82-15666 Ground-mounted thermal storage for the parabolic dish solar collector/Stirling engine system p0047 A82-11781 LECHPAMMER, E. Present status of Plorida Power Corporation's D.O.E. funded feasibility study of the Higgins plant repowering/coal gasification project p0089 A82-11834 LEE, A. A. Gas recovery from coal deposits [PB81-222291] LEE, C. K. B. p0103 N82-11271 Experimental demonstration of the feasibility of the Mist Flow Ocean Thermal Energy Process p0136 A82-18220 [AIAA PAPER 81-2596] LEE, D. D.
H-Coal product physical properties measurement
[DE81-029095] p0111 882-

p0111 882-13245

LEWIS, G.

LRE, J. B. A solar simulator-pumped gas laser :	for the direct
conversion of solar energy	p0044 A82-11710
Advanced solar energy conversion [NASA-CR-165060]	p0079 N82-15526
LEE, K. Conceptual design of 500 to 3000 np	
engines for stationary rower gener	ration p0123 A82-11807
LEE, K. W. Pingerprinting pollutant discharges	from synfuels
plants	p0001 A32-10697
LEB, L. L. Development of a thermodynamic prope	erties
correlation framework for the coal industry, phase 1A	
[DE81-030363] LEE, H. L.	p0111 N82-12985
Dimethyl sulfate in particulate mate and oil-fired power plants	er from coal-
LEE, R. L.	p0005 A82-16199
Three-dimensional, finite elemental simulating heavier-than-air gaseou	
over variable terrain [DE81-028689]	p0032 N82-15602
LRB, S. H. D. Studies of the regeneration of activ	-
used as granular sorbent for the c alkali wapors from hot flue gas of	ontrol of
(DE81-030192) LEE, W. B.	p0008 N82-10590
Evaluation of techniques for reducir automotive fuel consumption	ng in-use
(PB81-233298) LEFFEL, C. S., JR.	p0026 N82-13985
Energy programs at the johns hopkins Applied Physics Laboratory	university
[PB81-218141] LEPPIBGUELL, J. W.	p0013 N82-11535
Low-cost mirror concentrator based of double-walled, metallized, tubular	
[DE81-027813] LEHTO, G. H.	p0081 N82-15551
Ampere-hour integrator battery charg	e controller p0153 A82-11737
LEIGH, J. G. US energy strategies: Some options	for
eliminating oil imports by the yea [PB81-226052]	F 2000 p0014 N82-11626
LBIPOLD, M. H. Low cost silicon-on-ceramic photovol	taic solar cells
LEISTNER, D.	p0059 A82-17098
K/u/-band flat-profile Si-IMPATT dio 10-percent efficiency	
LEMMON, A. H., JR.	p0058 A82-16132
Use of coal cleaning for compliance emission regulations	
[PB81-247520] LEGNARD, R. E.	p0034 N82-15618
Process development for improved SRC Kerr-McGee critical sclvent deash:	
fractionation studies [DE81-903785]	p0114 N82-14380
LEGIG, H. Effects of atmospheric variability o	n energy
utilization and conservation [DE81-026308]	p0008 N82-10592
LEUEG, D. C. Silicon solar cell process developme	nt,
fabrication and analysis [NASA-CR-163787]	p0063 N82-10500
Recent progress on the development o	
hollow fiber sodium-sulfur battery	p0123 A82-11777
LEVIESOE, G. E. Optimization of the composition and properties of AI-93 gascline	antidetonation
properties of AI-93 gascline	p0091 A82-15722

Oxide optimization at the p-Si/aqueous electrolyte

p0052 A82-13199

```
Evaluation of shale oil as a utility gas-turbine
      fuel
      [DE81-904234]
                                              p0107 N82-12251
The severity of institutional barriers affecting
      energy-from-municipal-waste technologies
      [DB82-000133]
                                              p0018 N82-12583
LEWIS, P. D.
    Modelling of the jet-stream Pluidyne
                                              p0124 A82-11812
LEWIS, P. P. Pulverized-fuel combustion: Modeling and scaleup
      methodologies
      [DE81-026546]
                                              p0093 N82-10158
    Development of a thermodynamic properties
      correlation framework for the coal conversion
      industry, phase 1A [DE81-030363]
                                              p0111 N82-12985
LI, S. S.
    Effects of low temperature periodic annealing on
      the deep-level defects in 200 keV proton
      irradiated AlGaAs-GaAs solar cells
LIBOWITZ, G. G.
Metal hydrides 1980; Proceedings of the
      International Symposium on the Properties and Applications of Metal Hydrides, Colorado Springs, CO, April 7-11, 1980. Volumes 1 & 2
                                              p0085 A82-16784
LIDOREBKO, B. S.
    Unconventional techniques of energy conversion
    Characteristics of CVD silicon carbide thermionic
      converters
                                              p0124 A82-11821
LIEB. D. P.
    Thermionic combustor application to combined gas
      and steam turbine power plants
                                              p0124 A82-11818
LIEBMAN, I.
    Suppression of coal dust explosion by water
      barrier in a conveyor belt entry [PB81-233306]
LIEVENS, E. J., JR.
    U.S. Department of Energy liquid synfuels overview p0090 A82-12531
LILIEN, G. L.
Photovoltaic market analysis program: Background,
      model development, applications and extensions
      [DE81-029711]
                                              p0073 N82-12609
LILLBY, D. G.

Flow aerodynamics modeling of an MHD swirl
combustor - Calculations and experimental
      verification
LIMAYE, D. B.
    Energy end-use requirements in manufacturing,
      volume 1
      [DE81-028975]
                                              p0064 N82-10512
    Energy end-use requirements in manufacturing,
      volume 3
     [DE81-027976]
                                              p0007 N82-10544
LIB, C. L.
    Effects of heat treatment on epitaxial silicon
      solar cells on metallurgical silicon substrates
                                             p0058 A82-16469
    Thin film photovoltaic devices
                                              p0063 N82-10491
LIN, B. H.
    Kinetics of reactions in a wet flue gas
      simultaneous desulfurization and denitrification
      system
     [DB81-029853]
                                              p0033 N82-15607
    Solar hydrogen system design considerations
                                              p0084 A82-11788
LINDHOLM, P. A.
   A method for experimental assessment of the
     shifting approximation, with application to polysilicon solar cells
                                              p0058 A82-16131
Potential environmental problems of enhanced oil and gas recovery techniques
     [ PB81-240186]
                                             p0034 B82-15637
```

interface

LIHDSAY, T. O. SPS fiber optic link assessment		
	p0147 N	82-12550
LINDSEY, W. C. Performance analysis and simulation of	f the S	PS
reference phase control system		82-12544
LING, J. S. Performance of advanced chronium elec	trodes	for
the NASA Redox Energy Storage Syste	D	82-12574
LINSCOTT, B. S.	•	02-12374
Aluminum blade development for the Mo 200-kilowatt wind turbine	a-oa	
[NASA-TH-82594] LIBSE, J.	p0143 N	82-14633
Analysis of the energy impacts of the Appropriate Energy Technology Small		.
Program: Method and results [DE81-029844]	p0028 N	82-14651
LIPSCHUTZ, R. Spectra over complex terrain		
[DE01-028734] LIPSCOMB, W. O.	-	182-13473
Survey of particulate emission macro- micro-sampling and sizing methods	and	
[DE01-028348] LIPSKA, A. B.	p0014 N	182-11642
Fire-protection research for energy t	echnolo	gy:
Fy 80 year end report [DE82-000970]	p0161 N	82-14649
LIPSKY, S. R. Development of newer methods for the	iso1=+-	On and
identification of certain component	s found	l in
complex mixtures derived from energy		
the determination of their biologic		
via bioassay systems [DE81-028311]		182-10148
LITEA, A. H. Photovoltaics, the solar electric sol		
LITTLE, J. R.	_	82-12532
Biomass energy systems: Descriptions		
employment requirements for typical		
[DE82-000236]		182-13538
Education and training implications of energy system use	T DIOM	ເລລ
Energy system use [DE81-029956] LITTLEJOHN, D.	p0028 1	182-14664
Kinetics of reactions in a wet flue of simultaneous desulfurization and de		cation
system [DE01-029853]		182-15607
LIVENGOOD, C. D.	-	
Economic and environmental tradeoffs conversion		
[CONF-800608-8]	-	182-10598
Numerical simulation of sclar cell or voltage decay	en circ	uit
		82-10658
Investigations of the OCVD transients		ar cells 82-11334
LOCKE, P. B. High-pressure solvent extraction of m	ethane	from
geopressured fluids [DE81-027713]		182-15227
LOCKWOOD, A. Advanced high temperature thermoelect	-	
space power		,1 182-11823
LOMBARDO, J. J.	-	102-11023
Nuclear electric power for space syst Technology background and flight sy	stems p	rogram
IONCRICC D	p0123 2	82-11756
LONGRIGG, P. Semiconductor converters/inverters for photovoltaic power supply	ı	
•		82-11857
Rapid charging of lead-acid batteries electric-vehicle propulsion and sol		tric
storage [DB81-028084]	p0157 b	182-10548
Novel design of pressure vessels and	thermal	L
shields in coal gasifiers		

LOO, R. Y. Effects of low temperature periodic annealing on the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells LORENZO. B. Chromatic aberration effect on solar energy systems using Presnel lenses p0052 A82-13284 Up- and down-wind rotor half interference model for VART [AIAA PAPER 81-2579] n0129 A82-14031 LOUIS, J. P. Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification p0127 A82-12113 Key contributions in MHD power generation [DE81-028121] LOUTPY, B. O.

Low frequency capacitance characterizations on indium/x-phase of metal free phthalocyanine solar cells p0053 A82-13806 Thermionic combustor application to combined gas and steam turbine power plants D0124 A82-11818 LUCARELLI, B. Analysis of the energy impacts of the DOE Appropriate Energy Technology Small Grants Program: Method and results
[DE81-029844] n0028 NR2-14651 LUCZAK, P. J.
Investigation of the in-situ oxidation of methanol in fuel cells [AD-A105947] LUDWIG, D. Calculation of natural modes of vibration for rotor blades by the finite element method [DFVLR-FB-81-07] p0136 N8: p0136 N82-10452 LUEBKE, M. Oxide optimization at the p-Si/aqueous electrolyte interface p0052 A82-13199 LUFT, F. Methodology for the evaluation of aerodynamic performance and rotor optimization under constant RPMoperation [AIAA PAPER 81-2560] LUMBE, E.
Sulfur in the air in the capital (Helsinki)
metropolitan area: ITASAT-project
[RR-614.71] p0025 p0025 N82-13553 SPS phase control studies p0147 N82-12549 SPS antenna element evaluation p0148 N82-12555 LUNDBERG, D. R. Meteorological and climatological investigation: Review of January - June 1980 investigative period [DE81-030740] p0111 N82-12731 LUNDER, C. D. SPS antenna element evaluation p0148 N82-12555 LUNDGREN. R. Conceptual design of a glass-reinforced concrete solar collector [DE81-029280] p0065 N82-10542 LUO. D. Natural convection in air layers at various aspect ratios and angles of inclination p0058 A82-16249 Finite Lambertian source analysis of concentrators - Application to solar reflectors D0060 A82-17294 LUCURT. B. n-/indium tin oxide//p-InP solar cells

Model calculations of the chemical processes

Guidebook for solar process-heat applications

LUTTHANN, P.

[DE81-027977]

occurring in the plume of a coal-fired power plant p0005 A82-16342

p0058 A82-16471

p0072 N82-12598

LYKOV, O. P.		MALONE, M. J.	
A protective additive for jet fuels	p0090 A82-12022	Electric utility modeling extensions solar plants	to evaluate
LYNN, D. K. Design considerations for vehicular in	_	MANASSE, P. K.	p0061 A82-18025
	p0138 #82-10961	Puels and chemicals made from solar [DE81-025018]	energy p0077 N82-14384
US energy strategies: Sche options in	for	MANGOLDS, A. Geologic considerations in undergrou	nd coal mining
eliminating oil imports by the year [PB81-226052]		system design [NASA-CR-164961]	p0104 N82-11516
M	• • • • • • • • • • • • • • • • • • • •	MANIKOPOULOS, C. N. ZnO - p-InP heterojunction solar cel	ls
HACCARLEY, C. A.		MANLEY, R.	p0051 A82-12821
A study of factors influencing therm backfiring in hydrogen fueled engine methods for backfire control		An estimate of OTEC costs, market po proof-of-concept vessel financing [AIAA PAPER 81-2567]	tential and p0003 A82-14024
MACDOWELL, J. R. Blomass resources for alcohol fuels	p0084 A82-11791	Control of utility boiler and gas to pollutant emissions by combustion	
	p0090 A82-12533	phase 2	p0015 N82-11654
Thermal deformation of concentrators	in an	[PB81-222267] HAPP, H. P., JR.	-
antisymmetric temperature field	p0062 A82-18698	Costs for alternative grain-residue- systems	
MACKOR, A. Photocorrosion of strontium titamate		[DE81-029072]	p0110 #82+12633
MADHUSUDAH, M.	p0057 A82-16056	The application of reversible chemic to solar thermal energy systems	
Optimization of heat losses in normal flat-plate collector configurations		Materials science issues encountered	
and performance	p0059 A82-16744	development of thermochemical conc	p0038 A82-10021
Nickel sulphide-lead sulphide and nic sulphide-cadmium sulphide selective solar thermal conversion		MARCH, F. Analysis of electric utility investm power	ents into wind
	p0059 A82-16745	[AIAA PAPER 81-2537] HARCIBIAK, T. J.	p0003 A82-14006
Analysis of thermal/mechanical energy concepts	-conversion	Assessment of the potential of coal- engines in total and integrated en	
	p0139 N82-11585	[DE82-000169] HARDESICE, H.	p0018 N82-12587
Amorphous silicon bibliography - Into	roduction p0053 A82-13737	High resolution, low cost solar cell development	contact
MAHAN, H. National photovoltaic program in amount	phous materials	[FASA-CR-165032] HARGULIES, A. E.	p0076 B82-13501
	p0070 N82-11609	Thermionic combustor application to and steam turbine power plants	combined gas
Series resistance effects in 20 sq contide-polycrystalline silicon solar		MARGULIES, M.	p0124 A82-11818
	p0051 A82-12819	Comparison of concepts for solar-hea solar-driven absorption and compre	
Thermionic application for future air power systems	force space	machines for air conditioning and preservation purposes, phase 1	
MAHONE, D.	p0124 A82-11822	[BMFT-FB-I-81-165] HARKMAN, M. A.	p0080 N82-15541
Incremental cocling load determination direct gain heating systems	on for passive	Experimental investigation of parabo solar concentration with tubular h	
[DE81-029882] HAIDANIK, IU. F.	p0081 182-15575	MARKSBERRY, C. L.	p0040 A82-10389
Effect of wick dryness on the perform pipes with separate channels	ance of heat	Industrial applications of MHD high air heater technology	temperature
MAIER, F.	p0005 A82-16272	[AIAA PAPER 81-2588] MHD oxidant intermediate temperature	p0130 A82-14037 ceramic
Development of a prototype of a 10 kl power plant	small solar	heater study [NASA-CR-165453]	p0144 N82-15527
[BMFT-FB-T-81-101] MAJ, S.	p0080 N82-15532	MARLOW, W. Real-time coarse-particle mass measu	rements in a
Reduced heat flow - Mean heat flow re for the continental geothermal pro-		high-temperature/pressure coal-gas treatment	ifier process
MAJMUNDAR, H. H. Resource assessment of Low and	p0089 A82-10372	[DE81-030039] Real time coarse particle mass measu high temperature and pressure coal	
Moderate-temperature geothermal wat Calistoga, Napa County, California	ers in	process treatment [DE81-030036]	p0033 N82-15609
[DE81-025559] HALATIDIS, H. A. Development of a modular heat exchange	p0109 N82-12518	Performance characteristics of autom in the United States, third series	
integrated latent heat energy store		Chrysler 318 CID (5.21), 2V [PB81-233025]	p0023 N82-13435
MALBYSKII, 10. B. Prospects for the development of scla	_	HARTIS, S. W. Economic implications of passive-sol	_
the USSR Production of electric por thermodynamics methods		for single-family residences in Al Mexico: A case study	
	p0039 A82-10385	[DB81-028402] Martinelli, R. M.	p0074 182-12630
		Ampere-hour integrator battery charg	e controller p0153 A82-11737

MARTINEZ, H. B.	look pipag	ECCABE, H. E.
Development of space reactor core	p0122 A82-11747	Passive/by standard
MARTINEZ, J. A.	potal nee tritt	[PB81-22
INEL goethermal environmental pro		ECCALL, G. H.
[DE81-025671]	p0008 N82-10591	Uncertaint
MARTINO, F. J. Calcium/metal sulfide battery dev	olormont program	ignition [DE81-02
[ANL-81-14]	p0158 N82-11578	MCCALLA, T.
MARTIROSIAN, A. B.	£ 1.100 0.00	Lightning
Ionization waves in an argon disc	harge in a	[AIAA PA
longitudinal gas flow	4405 40555	MCCANDLESS, I
Mison c p u	p0127 A82-12666	Catalytic [DB81-03
MASOH, C. P. V. Improved efficiency in the sulfur	dioxide - Todine	MCCANDLESS, S
hydrogen cycle through the use		The Seasat
	p0083 A82-11784	
MASON, R. L.		MCCARTHY, J.
Highway fuel economy study	n0026 N92-12096	Assessment
[PB81-233850] MASSIS, T. M.	p0026 N82-13986	[NASA-CI MCCARTNEY, E.
Catalytic effect of iron in hydro	gasification of	The use of
coal		energy o
[DE81-023928]	p0113 N82-14323	
MATHASON, J.		MCCARVILLE, A
Evaluation of shale oil as a util fuel	ity gas-turbine	Fundamenta fossil-i
[DE81-904234]	p0107 N82-12251	[DE81-03
MATHUR, P. C.	-	MCCLBLLAND,
Dependence of minority carrier di		Transwall:
illumination level and temperat		thermal
crystal and polycrystalline Si	p0053 A82-13804	DE81-02
MATHUR, S. S.	p0033 882-13804	Low-cost
Geometrical optical performance s	studies of a	double-
composite parabolic trough with		[DE81-0:
W1==== = = =	p0043 A82-11390	MCCOIN, D. K.
MATHUR, V. K.	noing diamonal	Design stu
Liquefaction of bituminous coals ore catalysts and hydrogen	using disposal	cone tra [NASA-CI
[DB81-029134]	p0093 N82-10154	MCCORKLE, K.
Puels and chemicals made from sol		The GA sul
[DE81-025018]	p0077 N82-14384	status i
MATSUMOTO, H.	a booting by bigh	MCCODETCE C
Space chamber experiments of ohmi power microwave from the Solar		MCCORNICK, C. Improveá j
potes assistant steam the bosas	p0145 A82-16991	synthes
MATTSSON, S. E.	-	[DE81-03
A modular simulation model for a		MCCORNICK, J.
[AIAA PAPER 81-2558]	p0128 A82-14017	Design cor
NAVERICE, A. W. Solar chemistry of metal complexe	ae .	power pl [DE81-76
Soldi Chemistry or metal complex	p0058 A82-16124	MCCOY, H.
MAYFIELD, M. W.	•	Up- and do
Water-related constraints to the		for VAWS
geothermal electric generating		[AIAA PA
[DE81-025138] MAYNARD, D. P.	p0007 N82-10561	MCCRARY, G. 1
Geologic considerations in underg	round coal mining	mechanis
system design	,	energy
[NASA-CR-164961]	p0104 N82-11516	
MAZBR, J. A.		MCCRARY, J. I
A method for experimental assessment assessment of the state of the st		An experia
polysilicon solar cells	pricacion to	energy
• • • • • • • • • • • • • • • • • • • •	p0058 A82-16131	,
MAZOR, S. D.		MCCREERY, J.
Evaluation of the micrc-carbureto		Use of coa
[NASA-CR-164958] MAZRIA, E.	p0016 N82-11994	emissio: [PB81-24
Passive solar technical planning	study	HCC ROSSON, P.
[EPRI-EM-1591]	p0072 N82-12578	Residual-
MCARTHUR, R. C.		analysis
Analysis of electric utility inve	estments into wind	[DE81-02
power [AIAA PAPBR 81-2537]	D0003 393-44006	Residual-c facility
MCBREEN, J.	p0003 A82-14006	[DE81-02
Design of a cell for electrode ki	inetic	MCDOWALD, R.
investigations of fuel cell rea		Plame-rete
	p0136 A82-18394	results
Investigation of the zinc electron [DE81-030221]	pode reaction p0157 N82-11368	test pro [DE81-03
MCBRYAR, H.	PO137 H02-11300	MCDOUGAL, A.

Development status of a regenerative fuel cell

p0153 A82-11707

system for orbital operation

ybrid solar components: An approach to d thermal test methods 27886] p0077 N82-13549 ties associated with inertial-fusion 254081 p0139 N82-11944 protection for wind turbine electronics PER 81-2571] p0129 A82-14028 P. P. hydrogenation of coal-derived liquids p0106 N82-12198 30485] S. W. t commercial demonstration program p0115 N82-14561 t of advanced coal gasification processes B-164949] p0098 N82-11146 . R. f semiconducting oxide ceramics in solar conversion p3059 A82-17099 als of nitric oxide formation in fuel combustion 30329] p0033 N82-15608 J. F. A modular visually transmitting storage wall p0160 N82+15579 298211 mirror concentrator based on inflated, walled, metallized, tubular films 27813] p0081 N82-15551 udy of a continuously variable roller action CVT for electric vehicles B-159841] p0159 N82-12445 lfur-iodine water-splitting process - A report p0084 A82-11844 polymers for enhanced oil recovery is and rheology 30194] D0118 N82-15509 . B. asiderations for vehicular fuel cell lants 69737] p0138 N82-10961 own-wind rotor half interference model p0129 A82-14031 APER 81-25791 mental study of SO3 dissociation as a sm for converting and transporting solar p0043 A82-11214 mental study of SO3 dissociation as a sm for converting and transporting solar p0043 A82-11214 al cleaning for compliance with SO2 n regulations 47520] p0034 N82-15618 . J. energy-applications program environmental s report p0024 N82-13525 energy-application program: EAST y requirements document, volume 1 27536] ention head burner efficiency test and analysis: Space-heating-equipment ogram 30219] p0093 N82-10153 MCDOUGAL, A. R. Solar energy modulator p0063 N82-10496 [NASA-CASE-NPO-15388-1] MCELEOY, J. P. Halogen acid electrolysis in solid polymer electrolyte cells D0084 A82-16346

MCPALL, R.	MEHEZES, S.
Development of a thermodynamic properties	Oxide optimization at the p-Si/aqueous electrolyte
correlation framework for the coal conversion industry, phase 1A	interface
[DE81-030363] p0111 N82-12985	MENGEL, E. B.
SCGUIMMESS, T. OTEC ocean system development	Alternate hybrid power sources for remote site applications
[AIAA PAPER 81-2590] p0130 A82-14038	[AD-A099471] p0024 N82-13512
ECCLOGICAL effects assessment: Requirements vs	MERCER, J. W. Review of simulation techniques for Aquifer
state-of-the-art	Thermal Energy Storage (ATES)
[DE81-028092] p0032 882-15598	[DE81-029943] p0156 N82-10532
MCKEMEIR, D. R. Colloidally deposited high-temperature solar	MERCER, R. W. Transwall: A modular visually transmitting
selective surfaces	thermal storage wall
p0055 A82-15439 HCKIHLEY, J. B.	[DE81-029821] p0160 M82-15579
Analysis of integrated fuel-efficient, low-noise	Improved technique to measure electronically AC
procedures in terminal-area operations [DE81-029833] p0022 H82-13014	losses in superconducting cables [DB81-029323] p0150 N82-15338
BCLARROR, F.	MEULENBERG, A., JR.
Overview of the applied tattery and electrochemical research program	High- and low-resistivity silicon solar cells p0046 A82-11762
[DE81-027397] p0158 N82-11594	MEYER, E. E.
MCMAHOW, T. Bational photovoltaic program in amorphous materials	An aeroelastic analysis of the Darrieus wind turbine [AIAA PAPER 81-2572] p0129 A82-14029
[DE81-025906] p0070 N82-11609	MRYERS, P. A.
MCMICHARL, W. J.	Comparison of Michigan Basin crude oils
Coal gasifier parameters influencing environmental pollutant production	p0091 A82-17007
[PB81-221301] p0011 N82-11273	Chemical heat pump program: An overview
Vapor-phase cracking and wet oxidation as potential pollutant control techniques for coal	[DE81-025086] p0012 N82-11414 MIALHE, P.
gasification	A practical method of analysis of the
[PB81-219594] p0015 N82-11661 MCMULLEE, J. W.	current-voltage characteristics of solar cells p0051 A82-12823
Hydrogen storage-bed design for tritium systems	MIGHOM, G.
test assembly [DB81-025336] p0086 N82-11262	Guidenook for solar process-heat applications [DE81-027977] p0072 N82-12598
MCNEIL, R. I.	HILES, C. R.
Investigation of mechanisms of hydrogen transfer in coal hydrogenation	Passive-solar-retrofit study for the United States Navy
[DB81-030492] p0099 N82-11165	[DE81-028921] p0074 N82-12629
MCHERNEY, G. M. Vertical-axis wind-turbine control strategy	MILES, J. Fabrication, testing, and modeling plars for a
[DE81-031932] p0141 N82-12591	125-kW counter-rotating-turbine wave energy
MCPHEDRAW, R. C. Bounds and exact theories for the transport	converter [DE81-023946] p0137 N82-10559
properties of inhomogeneous media	Ocean energy-waves, currents, and tides
p0056 A82-15607	[DE81-025708] p0105 N82-11611 MILLER, B. P.
Advanced Satellite Power System /SPS/ concept	The Seasat commercial demonstration program
p0049 A82-11839 HCVEY, J.	p0115 N82-14561
Evaluation of shale oil as a utility gas-turbine	Case studies in the application of air quality
fuel [DE81-904234] p0107 N82-12251	modelling in environmental decision making: Summary and recommendations
MCVEY, J. B.	[PB81-213233] p0009 N82-10605
The design of series-parallel connected thermionic converter arrays	Status of nickel/zinc and nickel/iron battery
p0124 A82-11820	technology for electric vehicle applications
MEADOR, C. L. Macro-engineering: The rich potential: Proceedings	[DE81-023572] p0157 N82-10962
of the Third Symposium, San Francisco, CA,	The nickel-hydrogen battery system - An historical
January 6, 1980 p0006 A82-18643	overview p0153 A82-11735
MEAGHER, J. F.	MILLER, W. J.
Model calculations of the chemical processes occurring in the plume of a coal-fired power plant	Review of simulation techniques for Aquifer Thermal Energy Storage (ATES)
p0005 A82-16342	[DE81-029943] p0156 H82-10532
MEI, J. S. An overview of fluidized-bed combustion /FBC/	HILLIGAN, R. T. Environmental and economic comparison of advanced
design practice	processes for conversion of coal and biomass
p0090 A82-11850	into clean energy [PB81-234239] p0023 N82-13256
Development of space reactor core heat pipes	HILOVICH, J. L.
p0122 A82-11747	The tilting mode in field-reversed configurations p0121 A82-11131
Modelling energy-economic interactions in	MILTON, G. W.
<pre>developing countries: A linear-programming approach</pre>	Bounds and exact theories for the transport properties of inhomogeneous media
[DB81-026048] p0020 N82-12637	p0056 A82-15607
MRIER, B. L. Urban ecosystem and resource-conserving urbanism	MINETTI-MEZZETTI, E. Aplanatic double reflection system for
in Third World cities	thermophotovoltaic applications - Design
[DE81-029854] p0016 H82-11995	P0060 A82-17293
BPA utility PGD (Flue Gas Desulfurization) survey	
[PB81-225773] p0015 N82-11679	

MIHKOV, V.		ž
Problems and potential for MHD retro existing coal-fired plants	ofit of	
[AIAA PAPER 81-2586]	p0130 A82-14036	
MINTURN, R. E. Annual cycle energy system		
[DE81-024911]	p0007 N82-10552	•
MIRTURSUROV, SH. Z. Investigation of the possibility of	nsina	
inexpensive concentrating systems		
of a photoelectric station	p0052 A82-13713	
MIRZAKHODZHABY, B. M.	-	
Method for calculating the unsteady conditions of the generator in a s	temperature	
refrigeration system	SOLAT	
KTCPATORU A	p0056 A82-15642	
MISKOLCZY, G. Thermionic combustor application to	combined gas	
and steam turbine power plants	-	
Characteristics of CVD silicon carbi	p0124 A82-11818 de thermionic	
converters	100 1001 210120	
MISSAL, D. W.	p0124 A82-11821	2
Solar energy system performance eval		
Forest City Dillon, Washington, D.	.C., January .	
1980 - December 1980 [DE81-028174]	p0068 N82-11560	
HITCHELL, H. A.	-	
Failure modes and effects analysis of coal-slurry preheater	of a	
[DE81-030425]	p0117 N82-15221	
HITCHELL, J. C. Stratigraphy and depositional history	ry of the Tola	
Limestone Upper Pennsylvanian (Mis		
Northern Midcontinent U.S.	p0116 N82-14711	1
MIX, T. S.	pot 16 862-14/11	
Energy conservation in distillation	~0.240 NO. 42504	ı
[DE81-028650] HIXON, D. A.	p0018 N82-12581	
Oxydesulfurization of coal by acidic	: iron sulfate	
solutions [DE82-000464]	p0106 N82-12199	
MIXON, F. O.	-	
Coal gasifier parameters influencing pollutant production	g environmental	
[PB81-221301]	p0011 N82-11273	
Vapor-phase cracking and wet oxidati potential pollutant control techni	ion as	
gasification	iques for cour	•
[PB81-219594] MODDEL, G.	p0015 N82-11661	
Carrier-collection efficiencies in a	amorphous	
hydrogenated silicon Schottky-barr	rier solar cells p0042 A82-11185	1
HOJOLA, C. C.	p0042 A02-11103	
Performance testing of a Savonius wi in shear flows	indmill rotor	1
in shear rives	p0125 A82-11827	
HOLT, W.		1
High efficient collector for small s facilities	sotar-boaered	
[BMFT-FB-T-81-156]	p0080 N82-15538	
MONTGOMERY, D. R. The Seasat connercial demonstration	Drogram	
	p0115 N82-14561	•
MOODY, J. B. Overview of the blomedical and envir	ronmental	
programs at the Oak Ridge National	l Laboratory	
[DE81-027864] HOOKHERJI, T. K.	p0021 N82-12765	1
Investigation of direct sclar-to-mic	CIOWAWE energy	
conversion techniques		ı
[NASA-CR-161883] NOORE, A. R.	p0067 N82-11544	
Amorphous boron-silicon-hydrogen all		
thin-film heterojunction solar cel [DE81-027234]	lls p0068 N82-11557	1
Amorphous boron-silicon-hydrogen all	loys for	
thin-film heterojunction solar cel [DB81-027254]		
HOORE, W. A.	p0068 N82-11558	
Comparison of Michigan Basin crude of	oils	

p0091 A82-17007

OORING, M. American Wind Energy Association, National Conference, Pittsburgh, PA, June 8-11, 1980, Proceedings p0132 A82-17626 MORCOS, S. H.
The effect of shielding on the aerodynamic performance of Savonius wind turbines Parametric sensitivity study for solar-assisted heat-pump systems [DE81-030309] p0067 N82-11407 MORGAN, J. D. Energy future: Prophets, profits and policies; Proceedings of the Seventh Annual UMR-DNR Conference on Energy, University of Missouri-Rolla, Rolla, MO, October 14-16, 1980. Volume 7 p0002 A82-12547 MORRIS, J. P.
High thermal power density heat transfer [NASA-CASE-LEW-12950-1] p0139 N82-11399 MORRIS, P. A. Evaluating R and D options under uncertainty. Volume 2: Atmospheric fluidized-bed combustion commercialization strategies [DE81-904246] Evaluating R and D options under uncertainty. Volume 3: An electric-utility generation-expansion planning model DB81-9042371 p0035 N82-16013 MORRISON, B. L. Effects of the Satellite Power System on low Earth orbit and geosynchronous satellites [PB81-232019] p0150 N82-13157 MORTIMER, A. R.
A review of rain erosion problems for aerogenerators p0130 A82-14356 MORTON, R. A. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p01 p0117 N82-15225 Structural evolution of three geopressured-geothermal areas in the Texas Gulf Coast [DE81-029799] p0118 N82-15505 MOSINÀ, L. I. A protective additive for jet fuels p0090 A82-12022 MOVSUMOV, E. A. Regime characteristics of a solar thermoelectric generator and comparison of experimental and calculated data p0040 A82-10390 MOYNIHAN, P. I. Fluidized bed coal combustion reactor p0097 N82-11144 [NASA-CASE-NPO-14273-1] MOYNIHAH, T. M. Development free-piston Stirling test-bed engine Magnetohydrodynamics (MHD) Engineering Test Facility (ETF) 200 MWe power plant. Design Requirements Document (DRD) [NASA-TM-82705] p0140 N82-12446 MUBAYĪ. V. Modelling energy-economic interactions in developing countries: A linear-programming approach f DE81-0260487 p0020 N82-12637 MUCHNIK, G. P. Unconventional techniques of energy conversion p0127 A82-13847 Photoelectrochemical cells using polycrystalline and thin film MoS2 electrodes p0057 A82-16053 MURLLER. P. Energy consumption analysis and comparative study of the operational results from heat pump plants [BMFT-FB-T-80-109] p0032 N82-15583 MUPPLER, L. J. P.

Geothermal systems: Principles and case histories

wn* •			
MUI, J. Y. P. Flat-plate solar array project. Task	1: Silicon	MYRZIE, V. I. Gallium-arsenic-antimony heterojunct:	ion photocelle
material: Investigation of the		united the first that the first	p0055 A82-14667
hydrochlorination of SiC1sub4 [NASA-CR-165042] p	p0078 N82-14631	N	·
MUKHOPADHYAY, K. Effect of annealing CdS on a sintered	Cds/Cu2s	BACHMAN, J. P.	stores
solar cell	p0051 A82-12820	Lightweight hydrides for automotive s hydrogen	
MULAC, A. J. Project DEEP STEAM: Fourth meeting of	-	HADLER, H. G.	p0084 A82-11790
technical advisory panel [DE81-029457] p	p0144 N82-15561	Development of a process for recovery components from complex hydrodesula	furization
MULLBH, E. C. Extensible bridge-conveyor concepts for face haulage		catalysts especially tungsten, moly vanadium, nickel and cobalt [BMFI-FB-T-80-186]	p0016 N82-12204
[DE81-031974] p	p0146 N82-12525	NALOS, B. J.	12204
MULLICK, S. C. A seasonally adjusted concentrator with		SPS large array simulation	p0071 N82-12540
modifications of absorber shape		SPS fiber optic link assessment	_
MULLIGAN, S. W.	p0059 182-16598	High efficiency SPS klystron design	p0147 N82-12550
Demonstration of Wellman-Lord/Allied C technology: Demontration test secon		SPS antenna element evaluation	p0148 #82-12552
[PB81-246316] p	nd year results p0034 N82-15626		p0148 N82-12555
MULLIE, J. P. Advances in space power research and t	technology at	Evaluation of thick wall wave guide	
the National Aeronautics and Space A		NAM, L. K. Some characteristics of silicon photo	•
MUMINOV, R. A.	-	. fabricated by planar technology	
Investigation of the possibility of us inexpensive concentrating systems in		WAMAN, T. M.	p0039 A82-10386
of a photoelectric station	p0052 A82-13713	Automotive fuel economy: Potential in through selected engine and different	
MUMBER, T.	-	lubricants	•
Calculation of the top loss coefficien network method and applications to s		[FB81-240467] NANDA, S. K.	p0030 N82-15453
collectors	p0056 A82-15653	A seasonally adjusted concentrator windifications of absorber shape	ith
MUNSON, T.		-	p0059 A82-16598
	p0087 N82-15231	NAMDI, A. K. Ionospheric effects in active retrodi	irecti v e array
MUOY, Y. H. A practical method of analysis of the	-	and mitigating system design	p0147 N82-12551
current-voltage characteristics of s	solar cells	NARAYANAN, T. V. Conceptual design of an advanced wate	-
MURLIDHAR, MR. Design and testing of a uniformly illu	p0051 A82-12823 uminating		
nontracking concentrator	p0042 A82-11209	NASSER, A. E. M. Otilization of wind/solar energy in o	-
MURPHREE, D. L. Optical diagnostic techniques for coal	-	electricity in Saudi Arabia	p0049 A82-11830
applications		NASSOPOULOS, G. P. Molten salt thermal energy storage si	•
MURPHY, H.	p0135 A82-17913 resses	Molten salt thermal energy storage su Solar Thermal Central Receiver plan	subsystem for ints p0047 A82-11780
Relaxation of geothermal-reservoir str induced by heat production		BATOLI, S.	-
[DE81-032024] p	p0105 N82-11715	A simplified model of the thermohydra behaviour of a linear collector net	
Use of solar thermal energy to generat		conversion of the solar energy	
Near-term improvements in parabolic tr		BAVATO, A.	p0062 A82-18816
economic and performance assessment		Oceans and ocean currents: Their inf	tiuence on
[DE82-001158] p MURR, L. B. Solar materials science	16013	Climate [DE81-027263] HAYAK, J. K.	p0016 N82-11731
	p0037 A82-10007 efects in	Thermal performance of a solar still	p0058 A82-16229
solar materials		BAZAROV, A. Thermal deformation of concentrators	•
Characterization of selective solar ab		Thermal deformation of concentrators antisymmetric temperature field	
microstructures - Electron microscop		BERNAR, B.	p0062 A82-18698
HURBAY, D. P.		Costs for alternative grain-residue-o	collection
Exploration of coal and anthracitic ca shale resources, Narragansett Basin,		systems (DE81-029072)	p0110 N82-12633
Massachusetts, and Rhode Island [DE81-030895] p	p0104 N82-11523	NEEPER, D. A. Los Alamos National Laboratory Passiv	ve Solar Program
MURRAY, B. M. The contoured-oxide monolithic series-	_	[DE81-028778] NEIDINGER, B. H.	p0065 N82-10538
battery	-	Improved polymers for enhanced oil re	ecovery
MURRAY, J. M.	p0042 A82-11190	synthesis and rheology [DE81-030194]	p0118 N82-15509
Alkalıne solution water electrolysis -	- '81 p0083 A82-11786	BRILL, D. R. Overview of the Wind Energy Applicati	•
MURTHA, M. J.		for Hawaii	
Power-plant fly-ash utilization: A chemical-processing perspective	0000		p0133 A82-17634
	p0022 N82-13191		

HBLSOH, P. P.	_	
Evaporative hydrocarbon emissions for vehicle population	com a la	ırge
BELSCH, R. H.	-	A82-14442
Electrical effects of slag in a diff magnetohydrodynamic generator	tuse mod	le
BELSON, V.	p0143	N82-13550
American Wind Energy Association, Na Conference, Pittsburgh, PA, June 8		980,
Proceedings	p0132	A82-17626
WETHERTON, R. High-pressure solvent extraction of	nethane	from
geopressured fluids		N82-15227
BEUER, G. Development of a modular heat exchange	•	
integrated latent heat energy stor	e	N82-15584
NEUGROSCHEL, A.	-	
A method for experimental assessment shifting approximation, with appli	cation	to
polysilicon solar cells	p0058	A82-16131
Energy and development in Central A	erica.	Volume
1: Regional assessment [PB81-231540]	p0032	N82-15589
Energy and development in Central Am 2: Country assessments		
[PB81-231557] BEWELL, R. R.	-	N82-15590
Oceans and ocean currents: Their is climate	fluence	e on
[DE81-027263] NEWTON, R. A.	p0016	N82-11731
Study of gelled LNG [DE81-023259]	p0095	N82-10269
BGUYRH, T. H. Evaluation of organic acids as fuel	cell	
electrolytes	p0127	A82-12938
NGUYEN, V. V. Is geothermal simulation a catastrop	-	
[DE81-026750] NICHOLS, B. B.	p0105	N82-11588
Carlisle house: An all-sclar electr [DOE/ET-20279/133]		idence N82-11622
WIEMCZYK, T. H. Assessment of water supply contamina	-	
underground coal gasification [PB81-209215]		N82-12680
BIBVES, A. L. Sampling design for the 1980 commerce	_	
multifamily residential building s	sur vey	N82-11320
Technology change and energy consump	tion:	
comparison of residential subdivi:		N82-15555
NIEVES, L. A. Technology change and energy consum	tion:	A
comparison of residential subdivis	p0031	N82-15555
NIGIH, K. A. Wind-energy recovery by a static Sci	erbius	
induction generator	p0131	A82-15650
NIKIFOROVA, T. C. Jet fuel from carbon		
NILOV, IU. N.	_	A82-12021
Optimization of the composition and properties of AI-93 gasoline	antidet	conation
BITSCH, J.	-	A82-15722
The significance of hydrogen as futuency carrier		
Hydrogen as carrier of secondary ene	p0146	A82-17127 Proposal
for a research and development pro	gram	N82-15542
NOLL, R. B.	-	
Analytical evaluation of the aerodyn performance of a high-reliability wind turbine	amic vertica	ıl-aris

p0134 A82-17641

BORMAN, J. H.		
The GA sulfur-iodine water-splitting status report		
HOTESTEIN, J. B.	_	1844 1867
An overview of fluidized-bed combust: design practice		BC/ A82-11850
W205-S1 photovoltaic cells		
BOUN, R. J. Siting and land-use considerations in	-	A82-12824
development [AIAA PAPER 81-2541]		A82-14009
NOVAK, J. K. Cool-down flow-rate limits imposed by	_	
stresses in LNG pipelines [DE81-028731]	p0150	N82-14484
HOVAK, M. Ionization waves in an argon discharge longitudinal gas flow	ge in a	1
BUGENT, T.	p0127	A82-12666
An evaluation of three-way control si bed catalysts as applied to heavy-c engines	ingle a	and dual asoline
[PB81-224982] Heavy-duty engine baseline program an	id no s	N82-11477 sub x
emission standard development (1977) [PB81-244030]	2-73)	N82-15621
HUSSBERGER, A. A. Satellite power systems /SPS/ energy and power management	CODAG	csion
MUTTALL, L. J.	p0045	A82-11742
Development status of the General Ele polymer electrolyte water electroly	sis te	
0		
OBERG, K. Energy and development in Central Ame	erica.	Volume
1: Regional assessment [PB81-231540] Energy and development in Central Ame		N82-15589 Volume
2: Country assessments [PB81-231557]		N82-15590
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-co	p0032	N82-15590
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-co [DE81-028582] OBERMIR, G.	p0032 pal com p0098	N82-15590 bustion N82-11148
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational for pulveri	p0032 pal com p0098 of Gen p0130	N82-15590 N82-11148 Many A82-14358
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational formula (DES) OBERMATE, G. Wind energy for the Federal Republic OBERMATE, B. High efficient collector for small sof facilities	p0032 pal comp0098 of Gen p0130 plar-po	N82-15590 hbustion N82-11148 many A82-14358
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-computational tools	p0032 cal composes of Gen p0130 clar-po	N82-15590 N82-11148 many A82-14358 overed N82-15538
[PB81-231557] OBBRJOHN, W. J. Computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computation of the Federal Republic OBBRHAYE, B. High efficient collector for small so facilities [BMFT-FB-T-81-156] OBLAD, A. G. Investigation of factors affecting the combustion retorting of oil shale [DE82-000482]	p0032 pal composes pf Ger p0130 plar-pc p0080 ae in-s	N82-15590 N82-11148 many A82-14358 overed N82-15538
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-computational tools for the Federal Republic OBERMAYE, B. High efficient collector for small sof facilities [BMFT-PB-T-81-156] OBLAD, A. G. Investigation of factors affecting the computation retorting of oil shale [DE82-000482] OCOMBELL, L. G. Future of electricity for automobiles	p0032 pal comp0098 of Gen p0130 plar-po p0080 ie in-s	N82-15590 N82-11148 Tmany A82-14358 Owered N82-15538 Situ N82-12200
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computation of the Federal Republic OBERMAYE, B. High efficient collector for small so facilities [BMFT-FB-T-81-156] OBLAD, A. G. Investigation of factors affecting the combustion retorting of oil shale [DE82-000482] OCOMBELL, L. G. Future of electricity for automobiles electric vehicle concepts [DE81-028235]	p0032 pal comp0098 of Gen p0130 plar-pc p0080 se in-s p0106	N82-15590 N82-11148 Tmany A82-14358 Owered N82-15538 Situ N82-12200
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-computational tools for the Federal Republic OBERMAYE, E. High efficient collector for small sof facilities [BMFT-PB-T-81-156] OBLAD, A. G. Investigation of factors affecting the combustion retorting of oil shale [DE82-000482] OCOMBELL, L. G. Future of electricity for automobiles electric vehicle concepts [DE81-028235] OFFIELD, T. W. Geologic applications of thermal-inergeness of the constant of the collection of the collections.	p0032 pal com p0098 of Ger p0130 plar-p0 p0080 ae in-s p0106 s: Adv	N82-15590 N82-11148 Tmany A82-14358 Owered N82-15538 Situ N82-12200 Vanced N82-14987
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computation of the Federal Republic OBERHAYE, B. High efficient collector for small so facilities [BMFT-FB-T-81-156] OBLAD, A. G. Investigation of factors affecting the combustion retorting of oil shale [DE82-000482] OCOMBELL, L. G. Future of electricity for automobiles electric vehicle concepts [DE81-028235] OFFIELD, T. W. Geologic applications of thermal-iner from satellite [E82-10011]	p0032 pal comp0098 of Gen p0130 plar-po p0080 ae in-s p0106 s: Adv	N82-15590 N82-11148 Tmany A82-14358 Owered N82-15538 Situ N82-12200 Vanced N82-14987
[PB81-231557] OBENJOHN, W. J. Computational tools for pulverized-computational tools for the Federal Republic OBERMAYE, E. High efficient collector for small so facilities [BMFT-FB-T-81-156] OBLAD, A. G. Investigation of factors affecting the computation retorting of oil shale [DE82-000482] OCOMPELL, L. G. Future of electricity for automobiles electric vehicle concepts [DE81-028235] OFFIELD, T. W. Geologic applications of thermal-iner from satellite	p0032 pal composes of Gen p0130 plar-po p0080 ie in-s p0106 s: Adv p0029 ctia ma p0118 itrating pergy	N82-15590 Rbustion N82-11148 TMANY A82-14358 Wered N82-15538 Situ N82-12200 Vanced N82-14987 Apping N82-15489
[PB81-231557] OBENJOHN, W. J. Computational tools for pulverized-computational tools for the Federal Republic OBERMAYR, B. High efficient collector for small so facilities [BMFT-FB-T-81-156] OBLAD, A. G. Investigation of factors affecting the combustion retorting of oil shale (DE82-000482) OCOMBELL, L. G. Future of electricity for automobiles electric vehicle concepts [DE81-028235] OFFIELD, T. W. Geologic applications of thermal-iner from satellite [E82-10011] OGALLAGHER, J. J. Integrated function nonimaging concercollector tubes for solar thermal collector tubes for solar thermal (DE81-029677) OGDEN, S. B. Ion exchange characteristics of enhance recovery systems (miscibility studies)	p0032 pal composes pf Gen p0130 plar-pc p0080 ae in-s p0106 s: Adv p0029 rtia ms p0118 arratur pergy p0064 aced of	N82-15590 N82-11148 TMANY A82-14358 Owered N82-15538 Situ N82-12200 Vanced N82-14987 Apping N82-15489 N82-15489
[PB81-231557] OBENJOHN, W. J. Computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computation of the Federal Republic observable. OBERMAYE, E. High efficient collector for small so facilities [BMFT-FB-T-81-156] OBLAD, A. G. Investigation of factors affecting the combustion retorting of oil shale [DE82-000482] OCOMPELL, L. G. Future of electricity for automobiles electric vehicle concepts [DE81-028235] OFFIELD, T. W. Geologic applications of thermal-iner from satellite [E82-10011] OGALLAGHER, J. J. Integrated function nonimaging concercollector tubes for solar thermal collector tubes for solar	p0032 pal comp0098 of Ger p0130 plar-pc p0080 se in-s p0106 s: Adv p0029 tia ma po118 strating p0064 sced oi p0096 sc	N82-15590 Rbustion N82-11148 Rany A82-14358 N82-15538 Situ N82-12200 Vanced N82-14987 Apping N82-15489
[PB81-231557] OBERJOHN, W. J. Computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computational tools for pulverized-computation of the Federal Republic observable. OBERMAYR, B. High efficient collector for small so facilities [BMFT-FB-T-81-156] OBLAD, A. G. Investigation of factors affecting the combustion retorting of oil shale [DE82-000482] OCOMPELL, L. G. Puture of electricity for automobiles electric vehicle concepts [DE81-028235] OPPIELD, T. W. Geologic applications of thermal-iner from satellite [E82-10011] OGALLAGHER, J. J. Integrated function nonimaging concercollector tubes for solar thermal collector tubes for solar thermal collector tubes for solar thermal for [DE81-029677] OGDEN, S. B. Ion exchange characteristics of enhance recovery systems (miscibility study [DE81-769734]) OGRADI, W. E. Design of a cell for electrode kinetic investigations of fuel cell reactions.	p0032 pal comp0098 of Ger p0130 plar-pc p0080 ne in-s p0106 s: Adv p0029 stia ma p0118 ntrating p0064 nced of p0096 nced of p0096 nced of p0096 nced of p00136	N82-15590 Rbustion N82-11148 Rany A82-14358 Emany A82-15538 Situ N82-15200 Fanced N82-14987 Apping N82-15489 N82-10521 LL N82-10478 A82-18394
[PB81-231557] OBBRJOHN, W. J. Computational tools for pulverized-computational tools for the Federal Republic OBBRHAYR, B. High efficient collector for small so facilities [BMFT-FB-T-81-156] OBLAD, A. G. Investigation of factors affecting the combustion retorting of oil shale [DE82-000482] OCOMBELL, L. G. Future of electricity for automobiles electric vehicle concepts [DE81-028235] OFFIELD, T. W. Geologic applications of thermal-iner from satellite [E82-10011] OGALLAGHER, J. J. Integrated function nonimaging concercollector tubes for solar thermal electrotor tubes for solar thermal electrode tools for solar thermal electrode collector tubes for solar thermal electrode y systems (miscibility studional collections) [DE81-769734] OGRADI, W. E. Design of a cell for electrode kinetic investigations of fuel cell reactional collections.	p0032 pal composes of Ger p0130 plar-po p0080 ae in-s p0106 s: Adv p0029 tia ms p0118 atratic press p0064 aced oiles) p0096 ic p0036 ic p0136 lutant	N82-15590 Rbustion N82-11148 Rany A82-14358 Emany A82-15538 Situ N82-15200 Fanced N82-14987 Apping N82-15489 N82-10521 LL N82-10478 A82-18394

OKECH, B.	OTTO, H. C.
Sulfur pollution control. Phase 1: The disposal	Calcium/metal sulfide battery development program
program	[ANL-81-14] p0158 N82-11578
[PB81-222612] p0014 #82-11652	OTUSKI, H. H.
OLEHDER, B. Design of a cell for electrode kinetic	Bigh-pressure solvent extraction of methane from
investigations of fuel cell reactions	geopressured fluids
p0136 A82-18394	[DE81-027713] p0117 N82-15227
OLERSS, D. U.	OVSHIBSKY, S. R.
LLNL underground coal gasification project	Progress in large area photovoltaic devices based on amorphous silicon alloys
[DE81-030634] p0103 H82-11267	p0049 A82-11855
Soviet UCG experience specifically related to	ONENS, W. R.
field experiments in the United States	Assessment of MBD power plants with coal
[DB81-028642] p0111 N82-13244	
OLSEN, A. R.	[AIAA PAPER 81-2574] p0129 A82-14030
Sampling design for the 1980 commercial and	•
multifamily residential building survey	P ·
[DE81-028783] p0011 N82-11320	r
OLSEH, C. B.	PADDISON, P. C.
Mechanically stable hydride composites designed	Alternative ocean energy products and hybrid
for rapid cycling	geothermal-OTEC /GEOTEC/ plants
p0084 A82-16347	
OLSEE, R. B.	Energy programs at the johns hopkins university
Regenerative pyroelectric heat engine	Applied Physics Laboratory
p0126 A82-11833	[PB81-218141] p0013 N82-11535
OLSON, D. A.	PADRICE, T. D.
Measured performance of falling-jet flash	Catalytic effect of iron in hydrogasification of
evaporators	coal
[DB81-024355] p0161 N82-10565	[DE81-023928] p0113 N82-14323
OLSON, D. B.	PALHEDO, P
Soot formation in synfuels [DE81-030273] p0099 N82-11164	Energy and development in Central America. Volume 1: Regional assessment
OLSON, E. A. J.	[PB81-231540] p0032 N82-15589
Potential contribution of currently operating	Energy and development in Central America. Volume
nuclear-fueled electric-generating units to	2: Country assessments
reducing US oil consumption	[PB81-231557] p0032 N82-15590
[DE81-030497] p0031 H82-15553	PALMER, A. J.
OHASAHYA, C. B.	Towards a high-temperature solar electric converter
Performance testing of a Savonius windmill rotor	p0056 A82-15903
in shear flows	Study of radiatively sustained cesium plasmas for
p0125 A82-11827	solar energy conversion
ONDOY, J. H.	[NASA-CR-166265] p0075 N82-13039
Elemental composition of atmospheric	PALUSZEK, M. A.
fine-particles emitted from coal burned in a	A design for an MHD power plant as a prime mover
modern electric power plant equipped with a	for a Naval Vessel
flue-gas desulfurization system	[AIAA PAPER 81-2575] p0129 A82-14032
[DE81-030073] p0033 N82-15610	PANDE, K. P.
OMELL, J. J. A hidden advantage of permanent magnet electrical	ZnO - p-InP heterojunction solar cells p0051 A82-12821
generating systems p0122 A82-11720 ORCHIM. H.	PAHDYA, D. K.
p0122 A82-11720	Solution grown PbS/CdS multilayer stacks as
ORCHIE, M.	selective absorbers
Coal hydrogenation via bonding of metallic	p0041 A82-10472
compounds to coal, part 1. Solutilization of	PANOPSKY, H. A.
Illinois bituminous coal - the critical	Spectra over complex terrain
importance of methylene group cleavage, part 2	[DE81-028734] p0112 N82-13473
[DE81-027562] p0100 882-11236	PAPA, L.
ORLOSKI, H. J.	Theoretical analysis of the performance of a
Passive/hybrid solar components: An approach to	gravity-controlled solar concentrator
standard thermal test methods	p0050 A82-12812
[PB81-227886] p0077.N82-13549	PAPANIAN, V. O.
OSBORN, D. B.	Ionization waves in an argon discharge in a
Development of a solar receiver for an organic Rankine cycle engine	longitudinal gas flow
Hankine cycle engine p0048 A82-11800	p0127 A82-12666
OSTBERG, A. B.	PAPE, H. Utility operating strategy and requirements for
A modular simulation model for a wind turbine system	the wind power forecast
[AIAA PAPEE 81-2558] p0128 A82-14017	[AIAA PAPER 81-2539] p0127 A82-14007
OSTERLE, J. P.	PARASCHIVOIU, I.
Brayton cycle using dissociating nitrosyl chloride	Aerodynamic loads and rotor performance for the
p0126 A82-11852	Darrieus wind turbines
OSTERWALD, C.	[AIAA PAPER 81-2582] p0130 A82-14034
Series resistance effects in 20 sq cm indium tin	PARK, W.
oxide-polycrystalline silicon solar cells	Energy and development in Central America. Volume
p0051 A82-12819	1: Regional assessment
OTT, J. A.	[PB81-231540] p0032 N82-15589
An interferometer-based phase control system	Energy and development in Central America. Volume
p0147 H82-12547	1: Regional assessment
A sonic satellite power system microwave power	[PB81-231540] p0032 N82-15589
transmission simulator p0147 H82-12548	Energy and development in Central America. Volume
A theoretical study of Bicrowave beam absorption	2: Country assessments [PB81-231557] p0032 N82-15590
by a rectenna	PARKER, G. H. P0032 882-15590
p0149 N82-12563	Solar hydrogen system design considerations
OTTE, L. J.	
reat deposits of Dismal Swamp pocosins: Camden.	p0084 A82-11788
Peat deposits of Dismal Swamp pocosins: Camden, Currituck, Gates, Pasquotank, and Perquimans	p0084 A82-11788
	p0084 A82-11788

PARKER, W. G.	
An evaluation of alternate system con for solar repowering electric power	
101 Bull 10poroning outside posts	p0048 A82-11803
PARSLY, L. P.	
Failure modes and effects analysis of coal-slurry preheater	. a
[DE81-030425]	p0117 N82-15221
PASSAVANT, G. Heavy-duty engine taseline program as	nd NO cub w
emission standard development (197)	2-73)
[PB81-244030]	p0034 N82-15621
PATHAK, B. S. Energy balance and utilization of ag	ricultural
waste on a farm	100110101
[PB81-229262]	p0115 N82-14385
Studies on sugarcane as an energy cro [PB81-232308]	op for Punjab p0115 N82-14386
PATRYLAK, A. J.	•
Load-change testing of a large comme	rcial oxygen
plant [EPRI-NP-1824]	p0096 N82-10275
PAUL, W.	`
Carrier-collection efficiencies in a hydrogenated silicon Schottky-barr	
nydrogenated Silicon Schottky-ball	p0042 A82-11185
PAYNE, R.	•
Soot formation in synthetic fuel drop [DE81-028391]	plets p0092 N82-10150
Assessment of pulverized-coal-fired	
performance	-0105 NOO 40407
[DE81-030860] PEARMAN, G. I.	p0105 N82-12187
The annual variation of atmospheric	
concentration observed in the Nort	hern Hemisphere p0002 A82-12156
PEARSON, C.	PUUUZ 802-12130
Relaxation of geothermal-reservoir s	tresses
induced by heat production [DE81-032024]	p0105 N82-11715
Schlumberger resistivity study of the	
Springs region of northwestern New	
[DE81-025302] PEARSON, P. J., JR.	p0119 ¥82-15661
Review of simulation techniques for	Aguifer
Thermal Energy Storage (ATES) [DE81-029943]	p0156 N82-10532
PEARSON, V.	P0130 802-10332
Problems and potential for MHD retro	fit of
existing coal-fired plants	
FATAA PAPER 81-25861	.n0130 A82-14036
[AIAA PAPER 81-2586] PRASLEE, A. T., JE.	·p0130 &82-14036
PRASIRE, A. T., JR. Possible application of electromagne	_
PRASLER, A. T., JR.	tic guns to
PRASIZE, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S.	tic guns to p0135 182-18201
PRASIER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel	tic guns to p0135 182-18201
PRASIZE, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S.	tic guns to p0135 182-18201
PRASIZE, A. T., JE. Possible application of electromagne impact fusion PEMFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PEMG, Y.	tic guns to p0135
PRASIER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol	tic guns to p0135
PRASIZE, A. T., JE. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PRNG, Y. An integrating sphere based on absol measuring solar absorptance	tic guns to p0135
PRASIER, A. T., JR. Possible application of electromagne impact fusion PEMFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T.	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247
PRASIZE, A. T., JE. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PRNG, Y. An integrating sphere based on absol measuring solar absorptance	tic guns to p0135 &82-18201 ective p0060 &82-17253 ute method for p0058 &82-16247
PRASIER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PRNG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kb counter-rotating-turbine wa converter	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy
PRASIER, A. T., JR. Possible application of electromagne impact fusion PEMFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kw counter-rotating-turbine wa converter [DE81-023946]	tic guns to p0135 &82-18201 ective p0060 &82-17253 ute method for p0058 &82-16247
PRASIER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PRNG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kb counter-rotating-turbine wa converter	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy
PRASIER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PRNG, Y. An integrating sphere based on absol measuring solar absorptance PENMEY, T. Fabrication, testing, and modeling p 125-kb counter-rotating-turbine wa converter [DE81-023946] PENMEY, T. R. Overview and PY 1981 progress on ope power systems	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy p0137 N82-10559 n-cycle OTEC
PRASIER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kw counter-rotating-turbine wa converter [DE81-023946] PENNEY, T. R. Overview and FY 1981 progress on ope power systems [DE81-029277]	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy
PRASER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENMEY, T. Fabrication, testing, and modeling p 125-kb counter-rotating-turbine wa converter [DE81-023946] PENMEY, T. B. Overview and PY 1981 progress on ope power systems [DE81-029277] PERRIPA, L. Innovative equipment for small-scale	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy p0137 M82-10559 n-cycle OTEC
PRASIER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PRNG, Y. An integrating sphere based on absol measuring solar absorptance PENMEY, T. Fabrication, testing, and modeling p 125-kb counter-rotating-turbine wa converter [DE81-023946] PENMEY, T. R. Overview and PY 1981 progress on ope power systems [DE81-029277] PERRIRA, L. Innovative equipment for swall-scale developments	p0135 &82-18201 ective p0060 &82-17253 ute method for p0058 &82-16247 lans for a ve energy p0137 &82-10559 n-cycle OTEC p0144 &82-15580 hydro
PRASER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kw counter-rotating-turbine wa converter [DE81-023946] PENNEY, T. R. Overview and FY 1981 progress on ope power systems [DE81-029277] PERRIRA, L. Innovative equipment for small-scale developments [DE81-027820] PERRYRA, I.	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy p0137 N82-10559 n-cycle OTEC p0144 N82-15580 hydro p0141 N82-12634
PRESER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kb counter-rotating-turbine wa converter [DE81-023946] PENNEY, T. R. Overview and PY 1981 progress on ope power systems [DE81-029277] PERRIPA, L. Innovative equipment for small-scale developments [DE81-027820] PERRYRA, I. A pinhole model for metal-insulator-	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy p0137 N82-10559 n-cycle OTEC p0144 N82-15580 hydro p0141 N82-12634
PRASER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kw counter-rotating-turbine wa converter [DE81-023946] PENNEY, T. R. Overview and FY 1981 progress on ope power systems [DE81-029277] PERRIRA, L. Innovative equipment for small-scale developments [DE81-027820] PERRYRA, I.	p0135 &82-18201 ective p0060 &82-17253 ute method for p0058 &82-16247 lans for a ve energy p0137 &82-10559 n-cycle OTEC p0144 &82-15580 hydro p0141 &82-12634 semiconductor
PRESIDE, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kw counter-rotating-turbine wa converter [DE81-023946] PENNEY, T. R. Overview and FY 1981 progress on ope power systems [DE81-029277] PERRIRA, L. Innovative equipment for small-scale developments [DE81-027820] PERRYRA, I. A pinhole model for metal-insulator-solar cells	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy p0137 M82-10559 n-cycle OTEC p0144 M82-15580 hydro p0141 M82-12634 semiconductor
PRESCRE, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kb counter-rotating-turbine wa converter [DE81-023946] PENNEY, T. R. Overview and FY 1981 progress on ope power systems [DE81-029277] PERRIRA, L. Innovative equipment for small-scale developments [DE81-027820] PERRYRA, I. A pinhole model for metal-insulator-solar cells PERRZ-BLAECO, H. Cycle and performance analysis of ab	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy p0137 M82-10559 n-cycle OTEC p0144 M82-15580 hydro p0141 M82-12634 semiconductor
PRESER, A. T., JE. Possible application of electromagne impact fusion PEMFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PEMG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Pabrication, testing, and modeling p 125-kw counter-rotating-turbine wa converter [DE81-023946] PENNEY, T. R. Overview and FY 1981 progress on ope power systems [DE81-029277] PERRIRA, L. Innovative equipment for small-scale developments [DE81-027820] PERRYRA, I. A pinhole model for metal-insulator- solar cells PERRZ-BLANCO, H. Cycle and performance analysis of ab pumps for waste heat utilization	p0135 &82-18201 ective p0060 &82-17253 ute method for p0058 &82-16247 lans for a ve energy p0137 &82-10559 n-cycle OTEC p0144 &82-15580 hydro p0141 &82-12634 semiconductor p0056 &82-15442 sorption heat
PRESER, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kb counter-rotating-turbine wa converter [DE81-023946] PENNEY, T. B. Overview and FY 1981 progress on ope power systems [DE81-029277] PERRIRA, L. Innovative equipment for small-scale developments [DE81-027820] PERRYRA, I. A pinhole model for metal-insulator-solar cells PERRZ-BLANCO, H. Cycle and performance analysis of ab pumps for waste heat utilization [DE81-030705] PERRZ-J. H.	p0135 A82-18201 ective p0060 A82-17253 ute method for p0058 A82-16247 lans for a ve energy p0137 M82-10559 n-cycle OTEC p0144 M82-15580 hydro p0141 M82-12634 semiconductor p0056 A82-15442 sorption heat
PRESCRE, A. T., JR. Possible application of electromagne impact fusion PENFOLD, A. S. Sputter-deposited Al203/Mo/Al203 sel absorber coatings PENG, Y. An integrating sphere based on absol measuring solar absorptance PENNEY, T. Fabrication, testing, and modeling p 125-kw counter-rotating-turbine wa converter [DE81-023946] PENNEY, T. R. Overview and FY 1981 progress on ope power systems [DE81-029277] PERRIRA, L. Innovative equipment for small-scale developments [DE81-027820] PERRYRA, I. A pinhole model for metal-insulator-solar cells PERRZ-BLANCO, H. Cycle and performance analysis of ab pumps for waste heat utilization [DE81-030705]	p0135 182-18201 ective p0060 182-17253 ute method for p0058 182-16247 lans for a ve energy p0137 182-10559 n-cycle OTEC p0144 182-15580 hydro p0141 182-12634 semiconductor p0056 182-15442 sorption heat p0103 182-11405 ent and

```
PERISI, L. L.
   Alternative ocean energy products and hybrid geothermal-OTEC /GEOTEC/ plants
      [AIAA PAPER 81-2547]
                                                   p0128 A82-14012
PERKINS, R.
   Comparison of residential window distributions and
      effects of mass and insulation
      f DB81-0279381
                                                   p0017 N82-12283
PERLEUTTER, S.
Montana geothermal handbook: A guide to agencies,
      regulations, permits and financial aids for geothermal development
       [DB81-024315]
                                                   D0007 N82-10562
PERRES, L. B.

The universal plane method for calculating the dimensions of heliostats
PERROUD, P.
    The storage of hydrogen in the form of metal hydrides: An application to thermal engines
      [NASA-TH-76609]
                                                   p0086 N82-11225
PERRY, H.
    Factors in the development of a major US synthetic
                                                   p0001 A82-11543
PESCHKA, W. Liquid hydrogen for automotive vehicles -
      Experimental results
      [ASHE PAPER 81-HT-83]
                                                   p0083 A82-10968
    Hydrogen as carrier of secondary energy: Proposal
      for a research and development program [DFVLR-MITT-81-10] p00
                                                  p0087 N82-15542
PESSAGEO, S.

Kinetics of NO/ sub x formation during early stages of pulverized-coal combustion
      [DE81-029071]
                                                   p0014 N82-11641
PESSAGNO, S. L.
   Development of a high-temperature durable catalyst for use in catalytic combustors for advanced automotive gas turbine engines
[NASA-CR-165396] p0142 N82-135
                                                   p0142 N82-13510
PETER, W.
One-dimensional equilibrium-chemistry flow model
      for coal combustors
      [DE81-027622]
                                                   p0099 N82-11158
PETERS, D. A.
    Yawing of wind turbines with blade cyclic pitch
      variation
      [ DE81-030091]
                                                   p0138 N82-11045
PETERS, R. R.
    Solar energy system design: A simple method for sizing the collector field and thermal storage
      [DE81-028852]
                                                   p0065 N82-10541
PETERSON, D. M.
    Study of multi-megawatt technology needs for photovoltaic space power systems. Volume 1:
       Executive summary
    [NASA-CR-165323-VOL-1] p0078 No. Study of multi-megawatt technology needs for
                                                   p0078 N82-14636
      photovoltaic space power systems, volume
                                                   p0078 · N82-14637
       [NASA-CR-165323-VOL-2]
PETRICK, A.
Problems and potential for MHD retrofit of
       existing coal-fired plants
      [AIAA PAPER 81-2586]
PETROPP, I. K.
    Solid-state retrodirective phased array concepts
      for microwave power transmission from Solar
       Power Satellite
                                                   p0149 N82-12568
PETTIT, R. B.
    Solar mirror materials - Their properties and uses
       in solar concentrating collectors
                                                   p0037 A82-10012
    The effect of soiling on solar mirrors and techniques used to maintain high reflectivity
                                                   p0037 A82-10013
    Solar selective properties and high temperature
       stability of CVD ZrB2
                                                   p0057 A82-16055
    Oxidation of electrodeposited black chrome selective solar absorber films
                                                   p0060 A82-17255
PETTITT, R. A.
    Development of man-made geothermal reservoirs
                                                   p0097 N82-10480
      [LA-UR-81-852]
```

PETTY, P.	D-1000V 1 7
Biomass energy utilization in the Pacific	PLANSKY, J. L. Aluminum recovery from fly ash and shale-retort
Northwest: Impacts associated with residential	Wastes
use of solid fuels	[DE81-027675] p0099 N82-11154
[DE81-029137] p0115 N82-14383	measurement of thermal conductivities in coal fluids
PRITY, S. B.	[DB82-000523] p0109 N82-12400
Treatment of biomass gasification wastewaters using reverse osmosis	PLEASANT, B. L. Study of multi-megawatt technology needs for
[DE82-000698] p0025 N82-13566	photovoltaic space power systems. Volume 1:
PPEPPERKORN, C.	Executive summary
SOLPLAN report: An assessment of barriers and	[NASA-CR-165323-VOL-1] p0078 N82-14636
incentives to conservation and	Study of multi-megawatt technology needs for
alternative-energy use in the residential sector in Wisconsin	photovoltaic space power systems, volume 2 [NASA-CR-165323-VOL-2] p0078 B82-14637
[DOE/CS-30292/3] p0013 H82-11614	PLOEGER, D. W.
PFRIPPER, J.	Conceptual design of a glass-reinforced concrete
Advanced system experimental facility: Solid	solar collector
waste to methane gas. Background and process	[DE81-029280] p0065 \$82-10542
description	PODOLSKI, W. P.
[DE81-030198] p0101 882-11244 PPUDERER, B. A.	Cyclone performance estimates for pressurized fluidized-bed combustion
Overview of the biomedical and environmental	[DE81-028504] p0093 #82-10156
programs at the Cak Ridge National Laboratory	POHLMAN, S. L.
[DB81-027864] p0021 N82-12765	Corrosion science and its application to solar
PHIPPS, G. S.	thermal energy material problems
Automated Presnel lens tester system	p0038 A82-10017
[DE81-029483] p0066 N82-10863 PIAB, C. C. P.	POINT, N. Theoretical and numerical resolution of a
MHD generator scaling analysis for baseload	mathematical model of the release of solar
commercial power plants	energy from storage
[AIAA PAPEE 82-0394] p0135 A82-17922	p0061 A82-18232
Loading schemes for a 50 MW/th/ diagonally	PONNAPPAN, B.
connected BHD generator [AIAA PAPRE 82-0395] p0135 A82-17923	Performance of a cylindrical phase change thermal
[AIAA PAPRE 82-0395] p0135 A82-17923 PICCIBI, G.	energy storage unit [AIAA PAPER 82-0076] p0155 A82-17770
A simplified model of the thermohydraulic	POBS, R. L.
behaviour of a linear collector network for the	The effect of concentrator field layout on the
conversion of the solar energy	BB-1 small community solar power system
p0062 A82-18816	p0048 A82-11799
PIRRANTOZZI, R. Catalyst and reactor development for a	POHTIN, G. WW. A first order mathematical model of the lift/drag
liquid-phase fischer-tropsch process	characteristics of aerofoil sections
[DE81-028209] p0099 N82-11168	p0130 A82-14357
PIERCE, B. L.	POON, P. T.
Dynamic performance analysis for the solar hybrid	Secondary concentrators for parabolic dish solar thermal power systems
repowering of the El Paso Electric Company	
Nouman Ini+ No. 1	
Newman Unit No. 1 p0048 A82-11802	p0048 A82-11798
Newman Unit No. 1 p0048 A82-11802 PIERSON, E. S.	
p0048 A82-11802 PIERSON, E. S. Liquid-metal MHD for sclar and coal	p0048 182-11798 Secondary and compound concentrators for parabolic dish solar thermal power systems [NASA-CR-164960] p0068 N82-11550
p0048 A82-11802 PIERSON, E. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 H82-10553	p0048 182-11798 Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S.
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIERSON, P.	p0048 182-11798 Secondary and compound concentrators for parabolic dish solar thermal power systems [NBSA-CR-164960] p0068 N82-11550 POPEL, O. S. Analysis of the optical characteristics of solar
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 M82-10553 PINARD, P. A study of the purification process during the	p0048 A82-11798 Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S.
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PINARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors PORTHOV, G. G.
PIBRSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIBARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion	p0048 182-11798 Secondary and compound concentrators for parabolic dish solar thermal power systems [NASA-CR-164960] p0068 N82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors PORTHOY, G. G. Optimum reinforcement shapes and paths for
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PINARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion p0057 N82-16054	Secondary and compound concentrators for parabolic dish solar thermal power systems [NASA-CR-164960] p0068 N82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTNOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIHARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PIHDER. G. F.	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOW, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PINARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion p0057 N82-16054	Secondary and compound concentrators for parabolic dish solar thermal power systems [NASA-CR-164960] p0068 N82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTNOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PINARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588 PINTO, I.	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIHARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588 PINTO, I. Hechanical and nonlinear effects in microwave	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOW, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIERBO, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion p0057 A82-16054 PIERBER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588 PIETO, I. Mechanical and nonlinear effects in microwave power transmission	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R.
PIERSON, E. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIEARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion p0057 A82-16054 PIEDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588 PIETO, I. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504	Secondary and compound concentrators for parabolic dish solar thermal power systems [NASA-CR-164960] p0068 N82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTNOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DR81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIERBO, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion p0057 A82-16054 PIERBER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588 PIETO, I. Mechanical and nonlinear effects in microwave power transmission	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R.
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIERBO, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion p0057 A82-16054 PIERBER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588 PIETO, I. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DB81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 M82-11715
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIEARD, P. A study of the purification process during the elaboration by electron benbardment of polysilicon ribbons designed for photovoltaic conversion p0057 A82-16054 PIEDEE, G. F. Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588 PIETO, I. Mechanical and nonlinear effects in microwave power transmission p0145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] p0106 N82-12200	Secondary and compound concentrators for parabolic dish solar thermal power systems [NASA-CR-164960] p0068 N82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DB81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DB81-032024] p0105 N82-11715 POUTSMA, M. L. Thermolysis of naphthols
PIERSON, E. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIHARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PIHDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588 PIHTO, I. Mechanical and nonlinear effects in microwave power transmission PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] p0106 N82-12200 PLACE, N.	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 M82-11715 POUTSAM, M. L. Thermolysis of naphthols [DE81-029684] p0116 M82-15152
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIHARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PIHDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PIHTO, I. Mechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 M82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 M82-15152 POWELL, J. R.
PIERSON, E. S. Liquid-metal MHD for sclar and coal [DE81-023545] p0137 N82-10553 PIHARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PIHDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] p0105 N82-11588 PIHTO, I. Mechanical and nonlinear effects in microwave power transmission PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] p0106 N82-12200 PLACE, N.	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 M82-11715 POUTSAM, M. L. Thermolysis of naphthols [DE81-029684] p0116 M82-15152
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIHAED, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PIHDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Hechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, H. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACZEK-POPKO, E.	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 M82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 M82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIHAED, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PIHDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PIHTO, I. Mechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACERR-POPKO, E. Electrical properties of infrared photovoltaic	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 M82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 M82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIBAED, P. A study of the purification process during the elaboration by electron bendardment of polysilicon ribbons designed for photovoltaic conversion PO057 A82-16054 PIEDEE, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PIETO, I. Mechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACZER-POPKO, E. Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors	Secondary and compound concentrators for parabolic dish solar thermal power systems [NASA-CR-164960] p0068 N82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DB81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DB81-032024] p0105 N82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 N82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels [BBL-29281] p0086 N82-11257
PIRRSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PINARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Mechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACERE-POPKO, E. Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors PO136 A82-18466	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DB81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 M82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 M82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels [BBL-29281] p0086 M82-11257 Potential supply of synthetic fuels from Alaskan
PIERSON, E. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIHAED, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Hechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, H. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACER-POPKO, E. Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors PLANTE, E. R.	Secondary and compound concentrators for parabolic dish solar thermal power systems [NASA-CR-164960] p0068 N82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DB81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DB81-032024] p0105 N82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 N82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels [BBL-29281] p0086 N82-11257
PIRRSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PINARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Mechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACERE-POPKO, E. Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors PO136 A82-18466	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 M82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 M82-15152 POWELL, J. B. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels [BML-29281] potential supply of synthetic fuels from Alaskan hydroelectric power and coal
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIHARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Mechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive direct gain heating systems [DE81-02982] PLACZEK-POPKO, E. Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors PO136 A82-18466 PLANTE, B. R. Hass spectrometric studies of MHD slag thermochemistry [PB81-221434] PO138 N82-11173	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 N82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 B82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels [BBL-29281] p0086 N82-11257 Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0114 N82-14381 POWELL, W. B. Alternate hybrid power sources for remote site
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIHAED, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Hechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, H. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACER-POPKO, E. Electrical properties of infrared photovoltaic Cd/I/Hg/1-I/Te detectors PLANTE, B. R. Hass spectrometric studies of MHD slag thermochemistry [PB81-221434] Vaporization and chemical transport under coal	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 N82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 N82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels [BML-29281] p0086 N82-11257 Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0114 N82-14381 POWELL, W. R. Alternate hybrid power sources for remote site applications
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIBARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Hechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACER-POPKO, E. Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors PO136 A82-18466 PLANTE, B. R. Hass spectrometric studies of MHD slag thermochemistry [PB81-221434] Vaporization and chemical transport under coal gasification conditions	Secondary and compound concentrators for parabolic dish solar thermal power systems [NASA-CR-164960] p0068 N82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTNOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DB81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 N82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 N82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels [BHL-29281] potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0114 N82-14381 POWELL, W. B. Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIHAED, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Hechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACER-POPKO, E. Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors PLANTE, B. R. Hass spectrometric studies of MHD slag thermochemistry [PB81-221434] Vaporization and chemical transport under coal gasification conditions [PB81-245839] PLATT, H. D.	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE81-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 N82-11715 POUTSMA, M. L. Thermolysis of naphthols [DE81-029684] p0116 N82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels [BML-29281] p0086 N82-11257 Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0114 N82-14381 POWELL, W. R. Alternate hybrid power sources for remote site applications
PIERSON, E. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIBARD, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PIMDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Mechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACER-POPKO, E. Electrical properties of infrared photovoltaic cd/r/Hg/1-r/Te detectors PLANTE, B. R. Mass spectrometric studies of MHD slag thermochemistry [PB81-221434] Vaporization and chemical transport under coal gasification conditions [PB81-2245839] PLATT, B. D. Regional load-curve models: Scenario and forecast	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPPL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells POSBY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DR81-029772] p0117 N82-15225 POTTRE, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 M82-11715 POUTSMA, M. L. Thermolysis of naphthols [DR81-029684] p0116 N82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations [BHL-29281] p0086 N82-11746 Pusion as a source of synthetic fuels from Alaskan hydroclectric power and coal [DE81-025743] p0114 N82-14381 POWELL, W. B. Alternate hybrid power sources for remote site applications [AD-A099471] p0024 M82-13512 POWER, H. M. Analytical solution of a simulation model for wind turbines
PIERSON, B. S. Liquid-metal MHD for sclar and coal [DE81-023545] PIHAED, P. A study of the purification process during the elaboration by electron bombardment of polysilicon ribbons designed for photovoltaic conversion PINDER, G. F. Is geothermal simulation a catastrophe? [DE81-026750] PINTO, I. Hechanical and nonlinear effects in microwave power transmission PO145 A82-12504 PITT, C. H. Investigation of factors affecting the in-situ combustion retorting of cil shale [DE82-000482] PLACE, W. Incremental cooling load determination for passive direct gain heating systems [DE81-029882] PLACER-POPKO, E. Electrical properties of infrared photovoltaic Cd/x/Hg/1-x/Te detectors PLANTE, B. R. Hass spectrometric studies of MHD slag thermochemistry [PB81-221434] Vaporization and chemical transport under coal gasification conditions [PB81-245839] PLATT, H. D.	Secondary and compound concentrators for parabolic dish solar thermal power systems [MASA-CR-164960] p0068 M82-11550 POPEL, O. S. Analysis of the optical characteristics of solar collectors p0052 A82-13715 PORTHOV, G. G. Optimum reinforcement shapes and paths for rotating composite shells p0154 A82-14513 POSEY, J. S. Assessment of in-place solution methane in tertiary sandstones: Texas Gulf Coast [DE61-029772] p0117 N82-15225 POTTER, R. Relaxation of geothermal-reservoir stresses induced by heat production [DE81-032024] p0105 N82-11715 POUTSHA, M. L. Thermolysis of naphthols [DE81-029684] p0116 N82-15152 POWELL, J. R. Applications of power beaming from space-based nuclear power stations p0145 A82-11746 Pusion as a source of synthetic fuels [BNL-29281] p0086 N82-11257 Potential supply of synthetic fuels from Alaskan hydroelectric power and coal [DE81-025743] p0114 N82-14381 POWELL, W. R. Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 POWER, B. M. Analytical solution of a simulation model for wind

PRATER, L. S.	RAPPELLINI, G.
Bibliography of the seasonal thermal energy	A solar heating system with annual storage
storage library [DE81-030470] p0159 B82-12586	p0056 A82-15666 RAFIDI, B. R.
PRENCH, B. L.	Venezuela, Trimidad and Tobago: Crude oil
Testing and evaluation of a solar photovoltaic	potential from known deposits
flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558	[DE81-027023] p0096 N82-10474 RAGHURAMAN, P.
PRETO, S. K.	Data report for the northeast residential
Calcium/metal sulfide battery development program [ANL-81-14] p0158 N82-11578	experiment station, June 1981 [DE82-000068] p0077 N82-13533
[ANL-81-14] p0158 N82-11578 PRIANTE, S.	RAGLAND, K. W.
Pire-protection research for energy technology:	Coal combustion in high convective flows
Py 80 year end report [DE82-000970] p0161 N82-14649	[DE81-030391] p0106 H82-12194 HAGSDALE, L.
PRICE, J. P.	Heavy-duty engine baseline program and NO sub x
Environmental impacts of energy transportation	emission standard development (1972-73)
[DE82-900316] p0025 N82-13559 PRICHETT, N., III	[PB81-244030] p0034 N82-15621 RAMRY, H. J., JR.
Wind energy and the Nation's rural electric systems	Algorithm for computing in-situ combustion oil
p0091 A82-17645	recovery performance [DB81-030340] p0098 N82-11153
PUCHKOV, V. A. Jet fuel from carbon	[DB81-030340] p0098 N82-11153 RAMSDELL, J. V.
p0090 A82-12021	Numerical wind-speed simulation model
PUESCHEL, R. P. Environmental effects of pollutants from coal	[DB82-000956] p0113 M62-13627 Wind speed simulation for economic evaluation of
combustion. 2: The Colstrip, Montana Power Plant	wind energy conversion systems
[PB81-234114] p0026 N82-13573	[DE81-030077] p0119 N82-15560
PUGH, R. R. Pulverized-fuel combustion: Modeling and scaleup	BANDICH, B. Solar selective properties and high temperature
methodologies	stability of CVD ZrB2
[DB81-026546] p0093 N82-10158	p0057 A82-16055
PUGH, T. Mississippi County Community College solar	RANDOLPH, L. P. Advances in space power research and technology at
photovoltaic project	the National Aeronautics and Space Administration
[DB81-030669] p0068 N82-11554	p0122 A82-11755
PUMGS, H. Development of a process for recovery of valuable	RANTAKRANS, R. Sulfur in the air in the capital (Helsinki)
components from complex hydrodesulfurization	metropolitan area: ITASAT-project
catalysts especially tungsten, mclybdenum, vanadium, nickel and cotalt	[RR-614.71] p0025 N82-13553 RAO, H. G.
[BMPT-FB-T-80-186] p0016 N82-12204	Application of Bayesian analysis for wind energy
PUNWANI, D. V.	site evaluation
An overview of peat gasification p0089 A82-11848	p0113 N82-13619
P0003 402 11040	Water-pumping-windmill designs: A handbook
	Mgrer-bambind-Almanii gesidne: W nanabook
O	[DE81-904016] p0137 N82-10536
Q QUARLES, J. M.	[DE81-904016] p0137 N82-10536 RAO, S. K.
QUARLES, J. B. Identification and toxicity of	[DE81-904016] p0137 N82-10536
Identification and toxicity of fractionated-shale-oil components	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R.
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUORG, R. High-pressure solvent extraction of methane from	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONG, R. High-pressure solvent extraction of methane from geopressured fluids	[DE81-904016] p0137 N82-10536 RNO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RNO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C.
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUORG, R. High-pressure solvent extraction of methane from	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. B. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227	[DE81-904016] p0137 N82-10536 RNO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RNO, V. B. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHUSSEN. N. P.
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] R RAABE, P. German-Argentine experiment: Vertical-rotor wind	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 R RABBE, P. German-Argentine experiment: Vertical-rotor wind engine	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHOSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] R RAABE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, R.	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONEG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 R RAABE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 R RAABE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHUSSEB, H. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONEG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 R RAABE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABBE, J. D. Exploration of coal and anthracitic carbonaceous	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHUSSEB, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHJEN, S. SPS large array simulation p0071 N82-12540
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 R RAABE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, E. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] p0080 N82-15537 RABBEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin,	[DE81-904016] p0137 N82-10536 RNO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RNO, V. B. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEB, H. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHUER, S. SPS large array simulation p0071 N82-12540 RAVINDRA, N. M. Hodel based studies of some optical and electronic
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABBE, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHIEN, S. SPS large array simulation p0071 N82-12540 RAVINDRA, N. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABBEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A.	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHJRN, S. SPS large array simulation P0071 N82-12540 RAVINDRA, N. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RABLINS, N. T.
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABBE, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHIEN, S. SPS large array simulation p0071 N82-12540 RAVINDRA, N. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADER, M. L.	[DE81-904016] p0137 N82-10536 RNO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RNO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEN, N. F. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHIEN, S. SPS large array simulation p0071 N82-12540 RAVINDRA, M. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RAWLINS, W. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-15227 RABSCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABBE, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADBER, M. L. Investigation of the application of remote sensing	[DE81-904016] p0137 N82-10536 RNO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RNO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTGGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHJEN, S. SPS large array simulation RATHJEN, S. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RAWLINS, N. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADER, M. L.	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 BATHJEN, S. SPS large array simulation p0071 N82-12540 RAVINDRA, N. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RAWLINS, W. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155 RAY, J. C. Alternate hybrid power sources for remote site applications
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] R RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADER, M. L. Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] RADDOJCIC, R.	[DE81-904016] p0137 N82-10536 RNO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RNO, W. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHJEN, S. SPS large array simulation p0071 N82-12540 RAVINDRA, M. M. Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RANLINS, M. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155 RAY, J. C. Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE61-027713] p0117 N82-15227 RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] p0080 N82-15537 RABBEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523 RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADBER, M. L. Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] p0030 N82-15488 RADDOJCIC, B. A numerical model of a graded band gap	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASHUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTGGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHJEN, S. SPS large array simulation p0071 N82-12540 RAVINDRA, N. M. Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RAWLINS, N. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155 RAY, J. C. Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] P0117 N82-15227 RABBE, P. German-Argentine experiment: Vertical-rotor wind engine P0141 N82-12648 RAASCH, E. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-PB-T-81-154] RABBE, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADBE, M. L. Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] RADOJCIC, B. A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell p0050 A82-12817	RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHIJEN, S. SPS large array simulation p0071 N82-12540 RAVINDRA, N. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RANLIES, W. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155 RAY, J. C. Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 BEADER, G. T. Hodelling of the jet-stream Fluidyne
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine P0141 N82-12648 RAASCH, B. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADBER, M. L. Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] RADOJCIC, R. A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell p0050 A82-12817 Preparation and properties of graded band gap	[DE81-904016] p0137 N82-10536 RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMOSSEB, H. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHJEB, S. SPS large array simulation p0071 N82-12540 RAVINDRA, M. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RAWLIES, W. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155 RAY, J. C. Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 REAGAN, P.
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-15227 RASCH, E. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] EXPLORATION OF coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADER, M. L. Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] RADOJCIC, B. A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell Preparation and properties of graded band gap CdS/x/Te/1-x/ thin film solar cells	RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RAO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHIJEN, S. SPS large array simulation p0071 N82-12540 RAVINDRA, N. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RANLIES, W. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155 RAY, J. C. Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 BEADER, G. T. Hodelling of the jet-stream Fluidyne
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE61-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-15227 RAASCH, R. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADER, M. L. Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] RADOJCIC, R. A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell Preparation and properties of graded band gap CdS/x/Te/1-x/ thin film solar cells P0051 A82-12818	RAO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 EMO, V. R. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] p0108 N82-12262 RASMUSSEB, B. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [DOE/ET-20279/130] p0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [DE81-904016] p0137 N82-10536 RATHJEB, S. SPS large array simulation p0071 N82-12540 RAVINDRA, M. M. Model based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RAWLIES, B. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155 RAY, J. C. Alternate hybrid power sources for remote site applications [AD-A099471] p0024 N82-13512 READER, G. T. Hodelling of the jet-stream Fluidyne p0124 A82-11812 REAGAN, P. Characteristics of CVD silicon carbide thermionic
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 R RAMBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAMSCH, R. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] p0080 N82-15537 RABEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523 RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADER, H. L. Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] p0030 N82-15488 RADOSEVICE, R. A numerical model of a graded band gap Cds/x/Te/1-x/ solar cell Preparation and properties of graded band gap Cds/x/Te/1-x/ thin film solar cells BADOSEVICE, L. G. Solar-central-receiver fuels and chemicals	RNO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RNO, V. B. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] P0108 N82-12262 RASHUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [D0E/ET-20279/130] P0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [D881-904016] PATHUEN, S. SPS large array simulation RAVINDRA, N. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RAWLIES, E. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [D881-029480] RAY, J. C. Alternate hybrid power sources for remote site applications [AD-A099471] PEADER, G. T. Hodelling of the jet-stream Fluidyne P0124 A82-11812 REAGAE, P. Characteristics of CVD silicon carbide thermionic converters
Identification and toxicity of fractionated-shale-oil components [DE81-028460] QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE61-027713] RABBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-15227 RAASCH, R. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] RABEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADER, M. L. Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] RADOJCIC, R. A numerical model of a graded band gap CdS/x/Te/1-x/ solar cell Preparation and properties of graded band gap CdS/x/Te/1-x/ thin film solar cells P0051 A82-12818	RNO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RNO, V. B. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] P0108 N82-12262 RASHUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [D0E/ET-20279/130] P0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [D881-904016] PATHUEN, S. SPS large array simulation RAVINDRA, N. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RAWLIES, E. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [D881-029480] RAY, J. C. Alternate hybrid power sources for remote site applications [AD-A099471] PEADER, G. T. Hodelling of the jet-stream Fluidyne P0124 A82-11812 REAGAE, P. Characteristics of CVD silicon carbide thermionic converters
Identification and toxicity of fractionated-shale-oil components [DE81-028460] p0021 N82-12766 QUONG, R. High-pressure solvent extraction of methane from geopressured fluids [DE81-027713] p0117 N82-15227 R RAMBE, P. German-Argentine experiment: Vertical-rotor wind engine p0141 N82-12648 RAMSCH, R. Organic fluids for the practical use in energy conversion systems of sclar power plants [BMFT-FB-T-81-154] p0080 N82-15537 RABEN, J. D. Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, Massachusetts, and Rhode Island [DE81-030895] p0104 N82-11523 RACKLEY, R. A. The AGT101 technology - An automotive alternative p0123 A82-11783 RADER, H. L. Investigation of the application of remote sensing technology to environmental monitoring [E82-10010] p0030 N82-15488 RADOSEVICE, R. A numerical model of a graded band gap Cds/x/Te/1-x/ solar cell Preparation and properties of graded band gap Cds/x/Te/1-x/ thin film solar cells BADOSEVICE, L. G. Solar-central-receiver fuels and chemicals	RNO, S. K. Thermal analysis of three zone solar pond p0054 A82-14406 RNO, V. B. Design and breadboard evaluation of the SPS reference phase control system concept p0072 N82-12545 RAPTIS, A. C. Density-measurement studies at the BI-GAS pilot plant [DE82-000910] P0108 N82-12262 RASHUSSEN, N. P. Testing and evaluation of a solar photovoltaic flywheel energy storage system [D0E/ET-20279/130] P0065 N82-10558 RASTOGI, T. Water-pumping-windmill designs: A handbook [D881-904016] PATHUEN, S. SPS large array simulation RAVINDRA, N. M. Hodel based studies of some optical and electronic properties of narrow and wide gap materials p0062 A82-18471 RAWLIES, E. T. Synthetic-fuel combustion; pollutant formation. Soot-initiation mechanisms in burning aromatics [D881-029480] RAY, J. C. Alternate hybrid power sources for remote site applications [AD-A099471] PEADER, G. T. Hodelling of the jet-stream Fluidyne P0124 A82-11812 REAGAE, P. Characteristics of CVD silicon carbide thermionic converters

REDDY, G. B.	,	RICHARDS, D.	
Solution grown PbS/CdS multilayer statements selective absorbers	acks as	Alternative ocean energy products an geothermal-OTEC /GEOTEC/ plants	d hybrid
RRICHERT, J. D.	P0041 A82-10472	[AIAA PAPER 81-2547] RICHARDS, H. L.	p0128 A82-14012
Boiling flow instability of a fixed	Birror	Geomagnetic and magnetotelluric soun	
distributed focus solar receiver	p0041 A82-10810	area of the Central Buropean rift (BMFT-FB-T-81-111)	system p0119 N82-15656
Performance of advanced chromium elec-	ctrodes for	RICHMOND, J. K. Suppression of coal dust explosion b	v water
the NASA Redox Energy Storage Syst	e n	barrier in a conveyor belt entry	
[HASA-TH-82724] BRID, B. C.	p0159 N82-12574	[PB81-233306] BICHTER, B. E.	p0024 N82-13489
Liquid natural gas rapid phase trans. [PB81-244774]	itions p0118 #82-15232	Dimethyl sulfate in particulate matt and oil-fired power plants	er from coal-
RRID, R. L.			p0005 A82-16199
Seasonal performance factors for act. systems and heat-pump systems	ive solar	RICHTER, W. Assessment of pulverized-coal-fired	combustor
[DE81-028569] REIDIEGER, F.	P0074 N82-12625	performance [DE81-030860]	p0105 N82-12187
Development of a metal hydride proces		RIDGWAY, S. L.	·
hydrogen recovery from supplementer [DE81-022685]	d natural gas p0086 N82-14382	Experimental demonstration of the fe the Hist Plow Ocean Thermal Energy	
REILLY, H. J. Barriers to the utilization of synthematical synthematical synthemics and synthematical synthematical synthemics.	etic fuels for	[AIAA PAPER 81-2596] BIRBER, M.	p0136 A82-18220
transportation		Sulfur pollution control. Phase 1:	The disposal
[NASA-CR-165517] REIMHART, A.	p0023 N82-13243	program [PB81-222612]	p0014 N82-11652
Air circuit with heating rump . [BMPT-PB-T-80-188]	p0017 882-12404	Sulfur pollution control. Phase 1: program (sections 5 through 7)	The disposal
REIBRART, R. E.	-	[PB81-222804]	p0015 N82-11655
Application of large and small wind generators - A utility perspective		RIEDLER, W. The transformation of wind energy by	a high
REIBKEBS, L. H.	p0133 A82-17629	altitude power plant /HAPP/ [AIAA PAPER 81-2568]	p0128 A82-14025
Computer flight planning for fuel ef:		RIEGLER, G.	·
REINHOTH, P.	p0006 A82-17289	The transformation of wind energy by altitude power plant /HAPP/	a high
Preliminary investigation on a prima saving heat supply system for the		[AIAA PAPER 81-2568] RIGO, H. S.	p0128 A82-14025
district "Maria Lindenhof" in Dors		Magnetohydrodynamics (MHD) Engineeri	
Germany [BMFT-PB-T-80-157]	p0008 #82-10572	Pacility (BTF) 200 HWe power plant Requirements Document (DRD)	. Design
REINSTROM, R. M. Carbonate fuel cell power plant syst.	-	(NASA-TH-82705) RINEHART, B. H.	p0140 N82-12446
	p0131 A82-15069	DOE small-hydropower demonstration p	
REITER, E. R. Effects of atmospheric variability of	n energy	[DE81-027819] RISSER, V. V.	p0020 N82-12636
utilization and conservation [DB81-026308]	p0008 #82-10592	The El Paso electric 20-kilowatt photoatt photoatt photoatt	tovoltaic system p0060 A82-17761
RESPROE, D. A.	-	The Lea county electric 100-kilowatt	-
A computer model of a stirling engine two-phase two-component working flu		grid-connected photovoltaic system [AIAA PAPER 82-0067]	p0061 A82-17764
REBNE, R. A.	p0137 N82-10492	RITZCOVAS, P. J. Alternative ocean energy products and	d hybrid
Carcinogenic effects of coal-convers:		geothermal-OTEC /GEOTEC/ plants	
[DE81-028108] REVERE, W.	p0029 N82-14803	[AIAA PAPER 81-2547] ROBBINS, W. H.	p0128 A82-14012
Configuration selection study for ise using parabolic dish modules	olated loads	Energy potential and early operations for large wind turbines	al experience
[AIAA PAPER 81-2549]	p0061 A82-18223		p0132 A82-17627
Process development for improved SEC	options.	ROBERTS, B. W. The stability of a tethered gyromill	
Kerr-McGee critical solvent deashir fractionation studies	ng and	[AIAA PAPER 81-2569] ROBERTS, R.	p0129 A82-14026
[DE81-903785]	p0114 N82-14380	Status of the DOE battery and electro	ochemical
Unconventional techniques of energy		technology program 2 [DE81-029879]	p0156 #82-10540
BIBB, P. L.	p0127 A82-13847	ROBERTSON, R. C. Rater-related constraints to the deve	elopment of
Possible application of electromagnet	tic guns to	geothermal electric generating state	tions
impact fusion	p0135 A82-18201	[DE81-025138] ROBERTUS, R. J.	p0007 N82-10561
RICE, J. S. An interferometer-based phase control	l system	Kinetics and catalysis of producing s gases from biomass	synthetic
	p0147 N82-12547	[PB81-217614]	p0095 #82-10272
A sonic satellite rower system micron transmission simulator	_	ROBINSON, G. L. Use of coal cleaning for compliance to	with SO2
A theoretical study of microwave bear	p0147 N82-12548 absorption	emission regulations [PB81-247520]	p0034 N82-15618
by a rectenna		ROCER, M. P.	-
BICE, H. P.	p0149 N82-12563	Calcium/metal sulfide battery develop [ABL-81-14]	pment program p0158 N82-11578
The Rogers focusing heliostat experimat Rensselaer Polytechnic Institute		ROCK, B. J. Fuclear electric power for space syst	tems -
[PB81-226813]	p0071 N82-11625	Technology background and flight sy	

•		
ROCKEY, D. Nonimaging concentrators for photovol in space	ltaic a	rrays
•	p0046	A82-11761
ROCKEY, D. B. High performance silicon solar arrays advanced structures	s emplo	ying
RODE, J. S.	p0045	A82-11758
The GA sulfur-iodine water-splitting	proces	ss - A
status report	p0084	A82-11844
Methodology for determining the impact	ct of	
environmental regulatory programs [DE81-903429]	p0009	N82-10594
The effect of rotor blade thickness a finish on the performance of a small		
turbine		
[NASA-TH-82726] ROESSHER, J. D.	-	N82-13114
An assessment of selected solar energation activities	gy inac	istry
[PB81-222424] ROGERS, W. B.	p0071	N82-11623
The Rogers focusing heliostat experimat Rensselaer Polytechnic Institute		program
[PB81-226813] ROHATGI, N.		N82-11625
Coal desulfurization by lcw temperate	nce	
chlorinolysis, phase 3 [NASA-CH-164957] ROHATGI, H. K.	p0098	N82-11145
Hydrodesulfurization of chlorinated		N82-12240
ROHY, D. A. Lightweight hydrides for automotive:	storage	e of
hydrogen	p0084	A82-11790
Wind driven fluid devices for water		} A82-17639
ROLLBUHLER, R. J. Lewis Research Center's coal-fired,	pressui	ized.
fluidized-bed reactor test facilit [NASA-TM-81616]	y	N82-11397
ROSE, M. P. Techniques and applications of pulse	d power	,
technology	p0153	A82-11722
ROSEMARIN, C. S. Water-related constraints to the deve	elopme	nt of
geothermal electric generating sta [DE81-025138]		N82-10561
ROSS, B. Development of an all-metal thick fi	lm cos	Ł
effective metallization system for [NASA-CR-165043]		cells N82-14630
ROSS, J. On the efficiency of thermal engines		power
output - Harmonically driven engin		A82-14489
ROSS, L. R. Calcium/metal sulfide battery develo [ANI-81-14]	pment ;	program N82-11578
ROSSIGEUOLO, A. A. Electrochemical photovoltaic cells	•	
[DE81~769704] ROSSING, B. R.	_	N82-10568
Status report on MBD generator mater		A82-11854
ROTH, R. P. Solar mirror materials - Their prope	rties :	and uses
in solar concentrating collectors	pÒ037	A82-10012
The effect of soiling on sclar mirro techniques used to maintain high r	rs and eflect	LVity
ROTHWARP, A.	-	A82-10013
A pinhole model for metal-insulator-	Semico	nauctor

D0056 A82-15442

p0050 A82-12812

solar cells

Theoretical analysis of the performance of a

gravity-controlled sclar concentrator

ROTTIGHI. G. A.

ROTUNDO, L. Plorida's proposed OTEC pilot plant for Key West
[AIAA PAPER 81-2563] p0003 A82-14 p0003 A82-14021 ROUNTREDD, B. C. Solar Heating And Cooling Of Buildings (SHACOB):
Requirements definition and impact analysis-2. Volume 3: Customer load management systems [DE82-900208] p0071 N82-12280 ROY, W. B.
Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] D0009 N82-10608 ROZHDESTVENSKII, I. B.
Study of the electric conductivity of plasma from fuel combustion products containing a weakly ionizing impurity P0091 A82-12888 RUBERTO, B. G. Investigation of mechanisms of hydrogen transfer in coal hydrogenation [DB81-030492] p0099 N82-11165 RUBIN, C.
Application of orthotropic plate theory to windmill blade design p0121 182-10978 RUBY, J. D. Environmental and economic comparison of advanced processes for conversion of coal and biomass into clean energy [PB81-234239] p0023 N82-13256 RUCKELSHAUSS, G.
Assessment of potential future markets for the production of hydrogen from water [BMFT-FB-T-81-012] p0086 N82-12266 RUDLOPP, P. High-temperature counter-flow recuperator p0017 N82-12424 [DE81-031923] RUDNICKI, M. I. Study of gelled LNG [DB81-023259] D0095 N82-10269 ROIZ, R. Design and test of two-step solar oil shale retort [DE82-000964] p0077 N82-13543 RUNYAN, J. R.
Development of space reactor core heat pipes p0122 A82-11747 RUSSELL, M. C. Data report for the northeast residential experiment station, June 1981 f DB82-0000681 p0077 N82-13533 BUSSELL, P.

Low NO sub x heavy fuel combustor concept program [NASA-CR-165512] p0140 N82-12572 RUTTER, W. Comparative economic performance of selected passive solar heating and cooling technologies [DB81-030220] p0072 N82-12600 RYAN, C. B. Considerations for high accuracy radiation efficiency measurements for the Solar Power Satellite (SPS) subarrays p0148 N82-12559 RYBACH, L.
Geothermal systems: Principles and case histories p0090 A82-12275 The stability of a tethered gyromill [AIAA PAPER 81-2569] p0129 A82-14026 SAARI, D. P. Industrial applications of MHD high temperature air heater technology [AIAA PAPER 81-2588] p0130 A82-14037 MHD oxidant intermediate temperature ceramic heater study [NASA-CR-165453] D0144 N82-15527

SABISKY, B. National photovoltaic program in amorphous materials
[DE81-025906] p0070 N82-11609

SADICH, K. S.
Flexibilities in passive design: Examining some limiting solar myths [DB81-028401] p0073 N82-12623

SAHA, H.	SCHAURR, P.
Effect of annealing CdS on a sintered CdS/Cu2S	Improved technique to measure electronically AC
solar cell	losses in superconducting cables
p0051 A82-12820 SAIDOV, H. S.	[DE81-029323] p0150 N82-15338 SCHECHTER, R. S.
Production and certain properties of photoelectric	Tertiary oil recovery processes research at the
cells based on silicon epitaxial structures p0053 A82-13716	University of Texas
SAILOR, V. L.	[DB81-025222] p0096 N82-10477 SCHEHL, R. R.
Application of an LP model to strategic planning	Synthesis gas conversion to liquid fuels using
of multimational cooperative RD and D programs	promoted fused iron catalysts
[DE81-029325] p0035 N82-16014 SALARITA, K. S.	[DE81-030857] p0108 B82-12259 SCHEINIBE, A. L.
Energy balance and utilization of agricultural	Silicon solar cell optimization
waste on a farm	[AD-A106005] p0076 N82-13514
[PB81-229262] p0115 H82-14385 Studies on sugarcane as an energy crop for Punjab	SCHEIRER, S. T. Baseline data on utilization of low-grade fuels in
[PB81-232308] p0115 N82-14386	gas turbine applications. Volume 2: Hot
SALKBLD, B.	component corrosion evaluation
Macro-engineering: The rich potential; Proceedings	[DB81-903760] p0094 N82-10253
of the Third Symposium, San Prancisco, CA, January 6, 1980	SCHERK, K. P. Incorporation and impact of a wind energy
p0006 A82-18643	conversion system in generation expansion planning
SAMBELLS, A. P.	p0004 A82-15068
Blectrochemical photovoltaic cells [DE81-769704] p0066 N82-10568	SCHERTZER, S. P. Synthetic-fuel combustion; pollutant formation.
SANCHEZ, B.	Soot-initiation mechanisms in burning aromatics
Influence of the junction area to edge area ratio	[DE81-029480] p0093 N82-10155
on the open-circuit voltage of silicon solar cells	SCHEYER, K.
p0058 A82-16133	Sampling and analysis of potential geothermal sites [PB81-240061] p0119 N82-15593
Energy consumption analysis and comparative study	SCHIENBRIN, L. A.
of the operational results from heat pump plants	Wind turbine assisted diesel generator systems
[BMFT-FE-T-80-109] p0032 N82-15583 SANDERSON, I.	[AIAA PAPER 81-2559] p0128 A82-14018 SCHILLER, S.
The nuclear controversy: Unequal competition in	Controls for solar heating and cooling
public policy-making	[DE81-025209] p0070 N82-11593
[ERG-035] p0027 N82-14626	SCHINDBOLP, R.
SANDROCK, G. D. Metal hydrides 1980; Proceedings of the	Prequency response analysis of fluid control systems for parabolic-trough solar collectors
International Symposium on the Properties and	[DE81-029293] p0064 N82-10513
Applications of Metal Hydrides, Colorado	SCHRIDT, G.
Springs, CO, April 7-11, 1980. Volumes 1 & 2 p0085 A82-16784	Technological activities for high performance receivers
SANDUSKY, W. P.	[BHFT-FB-T-80-133] p0066 N82-10571
Analysis of data from the US Department of	Organic fluids for the practical use in energy
Energy's meteorological validation program [DB81-030100] p0097 N82-10655	conversion systems of solar power plants [BMFT-FB-T-81-154] p0080 N82-15537
SAROHIA, V.	[BMFT-FB-T-81-154] p0080 N82-15537 SCHMIDT, G. P.
Experimental and analytical investigation of a	Development of battery separator composites
fluidic power generator [JPL-PUB-81-100] p0142 N82-13386	[NASA-CR-165508] p0157 N82-11547
[JPL-PUB-81-100] p0142 N82-13386 SASHEVSKII, V. V.	SCHMIRD, B. Economic effects induced by ESA contracts, phase
A protective additive for jet fuels	2. Volume 1: Summary
p0090 A82-12022	[BSA-CB(P)-1462-VOL-1] p0161 N82-14981
SAUMDERS, J. Real-time coarse-particle mass measurements in a	SCHHITT, R. Technical and economic aspects of hydrogen storage
high-temperature/pressure coal-gasifier process	in metal hydrides
treatment	[NASA-TM-76610] p0086 N82-11223
[DE81-030039] p0119 M82-15604 Real time coarse particle mass measurements in a	SCHMUCKER, U. Geomagnetic and magnetotelluric soundings in the
high temperature and pressure coal gasifier	area of the Central European rift system
process treatment	[BMPT-FB-T-81-111] p0119 N82-15656
[DE81-030036] p0033 N82-15609 SAUNDERS, S. G.	SCHBELLER, D. High efficient collector for small solar-powered
Status of solar energy research and development in	facilities
Australia	[BMFT-FB-T-81-156] p0080 N82-15538
[NP-1903916] p0073 N82-12611	SCHEIPER, R. J. Computational tools for pulverized-coal combustion
SAIRBA, P. Dependence of minority carrier diffusion length on	[DE81-028582] p0098 N82-11148
illumination level and temperature in single	SCHNUENBERGER, W.
crystal and polycrystalline Si solar cells p0053 A82-13804	Hydrogen from solar energy
SCALF, K.	p0085 A82-17129 Hydrogen as carrier of secondary energy: Proposal
EPA utility PGD (Plue Gas Desulfurization) survey	for a research and development program
[PB81-225773] p0015 882-11679	[DFVLE-MITT-81-10] p0087 N82-15542
SCHADE, A. Safety and technical optimization of belt transfer	SCHOCK, A. Bodular isotopic thermoelectric generator
points with special consideration for the	p0122 A82-11753
suppression of noxious and explosive dusts	SCHOBLKOPP, W.
[BMFT-FB-HA-80-048] p0096 N82-10279 SCHAPIRO, N.	Improvement of thermal efficiency of flat plate solar collectors
Exploration of coal and anthracitic carbonaceous	[BHFT-FB-T-80-194] p0075 N82-12642
shale resources, Marragansett Basın,	SCHOERNER, R.
Massachusetts, and Bhode Island	High efficiency inversion layer solar cells on
[DE81-030895] p0104 N82-11523 SCHAPLOWSKY, R. K.	polycrystalline silicon by the application of silicon nitride
Study of gelled LNG	p0058 A82-16127
[DE81-023259] p0095 N82-10269	

SCHOTT, T.

Hydrogen as carrier of secondary energy: Proposal for a research and development program

[DFVLR-MITT-81-10] p0087 M82-1554 p0087 N82-15542 SCHREIBER, J. D. Parametric study of the cadmium thermoelectrochemical hydrogen cycle p0083 A82-11785 The Resonant Cavity Radiator (RCB) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 SCHUBERT, G. One-dimensional model of vapor-dominated geothermal systems D0089 A82-11033 SCHUBERT, J. P.

Fracture flow of groundwater in coal-bearing strata [DB81-023810] p0096 N82-10479 SCHUCHARDY, J. H. Considerations for high accuracy radiation efficiency measurements for the Solar Power Satellite (SPS) subarrays D0148 N82-12559 SCHUBLER, D. G. Photovoltaic system studies and developments p0049 A82-11804 SCHURTZ. H. Conceptual design of a large coal-fired stationary Stirling engine p0123 A82-11806 SCHURTZLE, D. Informational report on the measurement and characterization of diesel exhaust emissions p0009 N82-11175 [PB81-221251] SCHULLER, R. M. Coal fly ash: A review of the literature and proposed classification system with emphasis on environmental impacts [PB81-215014] p0009 N82-10608 SCHULTZE-BHONHOP, E. Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating [BMFT-FB-T-81-168] p003 p0030 N82-15168 SCHUSTER, J. R.
The GA sulfur-rodine water-splitting process - A status report p0084 A82-11844 SCHWAB, R. W. Fuel efficient flight profiles in an ATC flow management environment p0002 A82-13078 SCHURNDENAN, J. L. Low-cost mirror concentrator based on inflated, double-walled, metallized, tubular films [DE81-027813] p0081 N82-15551 SCOTT-HOBCK, J.

Space applicable DOE photovoltaic technology: An update [NASA-CR-165021] p0076 N82-13491 SCOTT-HONCK, J. A.
Cost and performance projections for SPS
photovoltaic blankets p0045 A82-11741 SCRIVEN, T. A. Potential environmental problems of enhanced oil and gas recovery techniques ГРВ 81-240186 1 p0034 N82-15637 SCULFORT, J.-L. Photoelectrochemical behaviour of CdS/NaI.3.3NH3 /liquid sodium iodide ammoniate/ junctions -Utilization in solar energy conversion p0051 A82-12822 SEAGER, C. H. The optimization of solar conversion devices p0039 A82-10025 SEALOCK, L. J., JR.
Kinetics and catalysis of producing synthetic gases from biomass [PB81-217614] p0095 N82-10272 SEDERQUIST, R. A. Evaluation of shale oil as a utility gas-turbine fuel [DE81-904234] p0107 N82-12251 SEEGER. F. Hydrogen from solar energy p0085 A82-17129 Hydrogen as carrier of secondary energy: Proposal for a research and development program [DPVLR-MITT-81-10] p0087 N82-1554 p0087 N82-15542 SEGUIN, H. J. J. Sputtered thin film electrodes for photoelectrochemical cells p0055 A82-15111 SEHGAL, H. K. Optimization of heat losses in normal and reverse flat-plate collector configurations - Analysis and performance p0059 A82-16744 Nickel sulphide-lead sulphide and nickel sulphide-cadmium sulphide selective coatings for solar thermal conversion p0059 A82-16745 SEIGER, B. W. Effect of depth of discharge on cycle life of near-term batteries D0153 A82-11714 SEKULIC, T. S. Methodology for determining the impact of environmental regulatory programs p0009 N82-10594 [DE81-903429] SELKIRK, H. B. Oceans and ocean currents: Their influence on climate [DE81-027263] p0016 N82-11731 SEN, K. A new structure for a semiconductor-insulator-semiconductor solar cell p0057 A82-15911 SEVERNS, J. G. A spacecraft thermophotovoltaic power source with thermal storage p0044 A82-11711 SEXTON, J. H. Enertech High Reliability prototype vibration analysis p0133 A82-17635 SFORZA, P. M. One-dimensional equilibrium-chemistry flow model for coal combustors [DE81-027622] D0099 N82-11158 SHAH. S. A. Modeling and testing a salt gradient solar pond in northeast Ohio p0043 A82-11210 SHALTENS, R. K.
Aluminum blade development for the Mod-OA
200-kilowatt wind turbine [NASA-TM-82594] p0143 N82-14633 SHAME, J.-Y.
An overview of fluidized-bed combustion /FBC/ design practice D0090 A82-11850 SHANKER, R. Oxidation of electrodeposited black chrome selective solar absorber films p0060 A82-17255 SHANNON, A. H.

Field demonstration of the conventional steam drive process with ancillary materials [DE81-026962] p01 p0115 N82-14523 SHANNON, M. J. Controlled Retracting Injection Point (CRIP) system: A modified-stream method for in situ coal gasification
[DR81-026477] p0102 N82-D0102 N82-11248 SHARMA, A. K.

Spectrally selective copper sulphide coatings p0040 A82-10468 SHARMA, B. P. Dependence of minority carrier diffusion length on illumination level and temperature in single crystal and polycrystalline Si solar cells p0053 A82-13804 SHARP, B. G. US energy strategies: Some options for eliminating oil imports by the year 2000 [PB81-226052] p0014 882-11626 SHEAPPER, J. D.

Effects of atmospheric variability on energy utilization and conservation [DE81-026308] p0008 N82-10592

SHEEB, S. H. SEPILRAIN, B. R. Density-measurement studies at the BI-GAS pilot Analysis of the optical characteristics of solar plant collectors [DB82-000910] p0108 N82-12262 p0052 A82-13715 SHEIR, J. B. SIBOLD, J. D. Series vs. shunt regulators for power control in Low cost silicon-on-ceramic photovoltaic solar cells satellite power systems p0059 A82-17098 p0045 A82-11738 SIDLES, P. H. Transwall: A modular visually transmitting SHRINBERG. H. Mechanically stable hydride composites designed thermal storage wall for rapid cycling [DB81-029821] p0160 N82-15579 DOOR4 A82-16347 SIEVERS, A. J. SHEKAR, A. M. The emissivity of metals p0038 A82-10014 Fundamental limits to the spectral selectivity of Peasibility of solar assisted ethanol production [AIAA PAPER 81-2533] p0054 A82-14004 SHELLY, D. C. composite materials Identification and toxicity of p0038 A82-10015 fractionated-shale-oil components SILVER, G. L. [DE81-028460] p0021 N82-12766 Plutonium thermochemical solar cell SHELPUK, B.
Ocean energy-waves, currents, and tides D0043 A82-11215 SIMANOVSKII, L. M.

Experimental investigation of parabolic-cylinder [DE81-025708] p0105 N82-11611 Overview and PY 1981 progress on open-cycle OTEC solar concentration with tubular heat receiver power systems [DE81-029277] p0040 A82-10389 p0144 N82-15580 SIMMONS, M. K. SHELTON, B. M.
Motor gasolines, winter 1980-81 Annual review of energy. Volume 6 p0001 A82-11540 [DE81-030845] p0117 N82-15224 Solar energy technology - A five-year update SHEN, W.-Z. p0044 A82-11541 An analytical model for high-low-emitter /HLE/ solar cells in concentrated sunlight The development of high efficiency cascade solar p0055 A82-15441 cells - An overview SHRPARD. W. S. p0047 A82-11794 Magnetchydrodynamic research program of the MHD SIMONS. S. Energy center at Mississippi State University Direct conversion of light to radio frequency energy and structural features of MHD radiant boilers p0045 A82-11712 [DE81-029901] p0139 N82-11934 SHEPHERD, A. D.
Water-related constraints to the development of geothermal electric generating stations
100007 N82-High-mass-flux coal gasifier [DE81-029807] p0094 N82-10257 SIMPSON, F. B.
Micro-hydropower in the United States [DE81-025138] p0007 N82-10561 SHEPHERD, K. P.
Establishment of noise acceptance criteria for [DE81-028271] p0031 N82-15567 SINCLÀIR, S. A. wind turbines Wood resources and utilization patterns in the p0125 A82-11825 North Central Region and energy needs for the manufacture of wood products SHERIDAN, B. R. [DE81-030356] A novel latent heat storage for sclar space p0019 N82-12604 SINGH, D. heating systems - Refrigerant storage p0043 A82-11386 Energy balance and utilization of agricultural SHERMAN, P. M.
Study of the formation of submicron particulates waste on a farm [PB81-229262] p0115 N82-14385 generated by coal combustion Studies on sugarcane as an energy crop for Punjab [PB81-232308] [DE81-027447] p0008 N82-10586 p0115 N82-14386 SINGH, B.
Solar data base management system SHEWEN, B. C. Optimization of flow passage geometry for air-heating, plate-type sclar collectors D0066 N82-10952 [DE81-023122] Singh, 1.
Solar data base management system p0055 A82-14846 Low frequency capacitance characterizations on [DE81-023122] p0066 N82-10952 indium/x-phase of metal free phthalocyanine SINGH, R. H. solar cells Geometrical optical performance studies of a p0053 A82-13806 composite parabolic trough with a fin receiver SHMATOK, IU. I. p0043 A82-11390 Experimental investigation of parabolic-cylinder SINGE, U. solar concentration with tubular heat receiver Thermal performance of a solar still D0040 A82-10389 p0058 A82-16229 SINGHAL, A. K. SHOBMAKER, C. B. Workshop proceedings: U-bend tube cracking in Geometrical optical performance studies of a composite parabolic trough with a fin receiver steam generators [DE81-903765] p0142 N82-13515 p0043 A82-11390 SHOR, G. I. SISTINO, A. A protective additive for jet fuels Correlation between results of zone method and experiment in radiative heat transfer [ASME PAPER 81-HT-71] p0 P0090 A82-12022 SHORE, R. p0121 A82-10958 SKEHAN, J. W. Potential environmental problems of enhanced oil and gas recovery techniques [PB81-240186] Planning a comprehensive program for exploration of the anthracite deposits of the Marragansett P0034 N82-15637 SHORT, T. H. Basin of Massachusetts and Rhode Island, phase 1 Modeling and testing a salt gradient solar pond in and 2 [DE81-028490] p0104 N82-11519 northeast Chio p0043 A82-11210 Exploration of coal and anthracitic carbonaceous shale resources, Narragansett Basin, SHOUCRI, M. H. RP-driven Tokamak reactor with sub-ignited, Massachusetts, and Rhode Island thermally stable operation [DE81-029437] [DE81-030895] D0104 N82-11523 p0139 N82-11935 SKILLERE, C. R. SHOUSHA, A. E. H.

Effects of double-exponential current-voltage Gas recovery from coal deposits
[PB81-222291] p0103 #82-11271 characteristics on the performance of solar cells p0058 A82-16472

PERSONAL AUTHOR INDEX SKINNER, W. V. SMITH, P. Aquifer thermal energy storage - A feasibility study for large scale demonstration p0154 A82-11846 High-temperature solar central receivers p0052 A82-12949 [PB81-247520] Creating a safer environment in US coal mines: SMITH, R. W. The Bureau of Mines Methane Control Program, 1964-79 [PB81-233918] D0112 N82-13488 SLAGER, L. E. First results from the UMass wind tunnel test [DE81-027254] program D0134 A82-17643 SHITH, S. D. SLATER, B. H. Molten-salt coal-gasification process development unit, phase 2 [DE81-023585] [DE81-030192] p0094 N82-10251 SLATTERY, P. E.
Proposed 12.5 MWe shelf-mounted OTEC pilot plant for power, water and mariculture at St. Croix [AIAA PAPER 81-2546] p0127 A82p0127 A82-14011 SLEGETR, 9. A. Development of catalytic systems for the conversion of syngas to jet fuel and diesel fuel and higher alcohols [NASA-TM-82709] [DE82-000067] p0108 N82-12255 SLEMMONS, A. J.
Conceptual design of a glass-reinforced concrete
solar collector for coal combustors [DE81-027622] [DE81-029280] D0065 N82-10542 SLOOP, J. L. Technological innovation for success - Liquid SHOW, G. C. hydrogen propulsion P0084 A82-16734 SHALLEY, W. M. Evaluation of techniques for reducing in-use automotive fuel consumption [PB81-233298] p0026 N82-13985 SMIRMOV, S. I.

Effect of inhomogeneous flow distribution in a system of heat-generating solar collectors p0044 A82-11423 [DE81-030669] Pailure modes and effects analysis of a SO, C. K. coal-slurry preheater [DE81-030425] p0117 N82-15221 industry, phase 1A [DE81-030363] SMITH, C. B.
An aeroelastic analysis of the Darrieus wind turbine
[AIAA PAPER 81-2572] p0129 A82-14029 SODERHOLM, L. H. SMITH, F. G. W. Waves of energy D0121 A82-10450 SODHA, M. S. Turbines in the ocean p0132 A82-16844 SMITH, G. A. Wind-energy recovery by a static Scherbius induction generator SOFER, S. S. p0131 A82-15650

SMITH, J. H.
End region and current consclidation effects upon

the performance of an MHD channel for the ETF conceptual design [AIAA PAPER 82-0325] Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic fuels production [DE81-030822] p0020 N82-12661 Development of testing procedures and bibliographic information relevant to the testing of solid wastes resulting from synthetic-fuels production [DE81-030671] p0021 N82-12673 End region and current consclidation effects upon the performance of an MHD channel for the ETP conceptual design [NASA-TH-82744] p0141 N82-12943

SHITH, L. G.
Carcinogenic effects of ccal-conversion materials [DE81-028108] p0029 N82-14803 SMITH, H. EPA utility FGD (Flue Gas Desulfurization) survey [PB81-225773] p0015 N82-11679 Method of determining the creep characteristics of composite materials p0154 A82-11779

SHITH, P. A.
Use of coal cleaning for compliance with SO2 emission regulations p0034 N82-15618

Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells p0068 N82-11557

[DE61-027234] p0068 1
Amorphous boron-silicon-hydrogen alloys for thin-film beterojunction solar cells

p0068 N82-11558

Studies of the regeneration of activated bauxite used as granular sorbent for the control of alkali vapors from hot flue gas of coal combustion P0008 N82-10590

SMITH, T. P.
Peasibility of solar assisted ethanol production [AIAA PAPER 81-2533] P0054 A82-14004

SHITHRICK, J. J.
Effect of positive pulse charge waveforms on the energy efficiency of lead-acid traction cells

SMOAK, R. H.
Use of ceramics in point-focus solar receivers [AIAA PAPER 81-2552] p0054 A82-14015

SMORTO, N.
One-dimensional equilibrium-chemistry flow model

p0099 N82-11158 Kinetics of NO/ sub x formation during early

stages of pulverized-coal combustion [DE81-029071] p p0014 N82-11641 Development of a high-temperature durable catalyst for use in catalytic combustors for advanced

automotive gas turbine engines [NASA-CR-165396] D0142 N82-13510

SNOWDEN, R.
Hississippi County Community College solar photovoltaic project p0068 N82-11554

Development of a thermodynamic properties correlation framework for the coal conversion

p0111 N82-12985 Experiences with a Grumman windstream 25

p0134 A82-17638

Thermal analysis of three zone solar pond p0054 A82-14406 Thermal performance of a solar still p0058 A82-16229

Biomass conversion processes for energy and fuels p0092 A82-18114

SOFRATA, H. A thermoelectric refrigerator powered by photovoltaic solar collectors

p0049 A82-11858 SORN, H. Y.
Investigation of factors affecting the in-situ combustion retorting of oil shale

[DE82-000482] p0106 N82-12200 SOKOLOV, E. V. Thermal deformation of concentrators in an

antisymmetric temperature field D0062 A82-18698

SOLIGI, C. T.
Optical degradation of antireflective silica film

on solar collector windows D0041 A82-10836 SOLIMAN, A. A. Sputtered thin film electrodes for

photoelectrochemical cells p0055 A82~15111

SOLHAR, P. J. A photovoltaic system with energy storage -Natural Bridges National Monument 100-kW system [AIAA PAPER 82-0066] p0155 A82-17763 Photovoltaic systems performance experience [DE81-025725] p0079 N82-14656

SOUNICESEN, T.			
		STEARNS, J. W.	
Baseline data on utilization of low-		High performance solar Stirling system	
gas turbine applications. Volume	3: Emissions	[AIAA PAPER 81-2554]	p0061 A82-18222
evaluation		STEEB, A.	
[DE81-903764]	p0006 N82-10254	Hydrogen from solar energy	
SOPORI, B.			p0085 A82-17129
Photovoltaic mechanisms in polycrys	talline thin	Hydrogen as carrier of secondary ene	rgy: Proposal
film silicon solar c∈lls		for a research and development pro-	gram
[DB81-030370]	p0072 N82-12608	[DFVLR-MITT-81-10]	p0087 N82-15542
SORENSEN, J. C.	•	STRELE, R. S.	•
Load-change testing of a large comme	ercial oxygen	Composite flywheel balance experience	•
plant		[DE81-769341]	p0157 N82-10549
	-0006 NO2-1027E		po 157 Hoz 10545
[BPRI-HP-1824]	p0096 N82-10275	STRIGRIANN, W.	
SOUBLL, R. R.	_	Market assessment of photovoltaic po-	
Oxidation of electrodeposited black	chrome	for agricultural applications in H	exico
selective solar absorter films		[NASA-CR-165441]	P0007 N82-10506
	p0060 A82-17255	STRIB, R. P.	
SPARKS, B.	•	Heat Transfer - Milwaukee 1981; Proce	eedings of the
Silicon solar cell optimization		Twentieth National Heat Transfer C	
[AD-A106005]	p0076 N82-13514	Milwaukee, WI, August 2-5, 1981	
SPEIDEL, K.	P. C.	22. 10 10 10 10 10 10 10 10 10 10 10 10 10	p0145 A82-10806
	cal an-nauarad	CRRITORDO N	PO 145 EGE 10000
High efficient collector for small	entar-howered	STRIBBERG, B.	_
facilities	2002 200 45530	Pusion as a source of synthetic fuel:	
[BMFT-FB-T-81-156]	p0080 N82-15538	[BNL-29281]	p0086 N82-11257
SPERBER, B. R.		Potential supply of synthetic fuels	from Alaskan
SPS large array simulation		hydroelectric power and coal	
	p0071 N82-12540	[DE81-025743]	p0114 N82-14381
SPS phase control studies	•	STRINGASS, H.	•
[p0147 N82-12549	Barket assessment of photovoltaic por	war systems
Bodified reference SPS with solid st		for agricultural applications in B	
	tate		D0077 N82-14627
transmitting antenna	24.0 405.66	(NASA-CR-165477)	puull 1862-14621
	p0149 N82-12566	STRIBBETER, D. A.	_
SPETH, S.		Second generation heliostat, volume	
Thermal processing of used catalysts	5	[DR81-029618]	p0069 N82-11564
[BMPT-PB-T-80-189]	p0016 N82-12205	STELLA, A. B.	
SPORTON, T. H.	•	Solar hydrogen system design conside:	rations
Microprocessor applications for the	monitoring and		p0084 A82-11788
control of gas supplies		STELLA, P.	
[ERS-E-276]	p0097 N82-10735	Space applicable DOE photovoltaic te	chnology. An
SPOTT, K. B.	pubsi 202 10703	update	cumorogy. am
			-0076 W00-12401
Air circuit with heating pump	0047 200 40404	[NASA-CR-165021]	p0076 N82-13491
[BMFT-FB-T-80-188]	p0017 N82-12404	STENBERG, V. I.	
SPRADLIN, H. K. L.		Chemistry of lignite liquefaction	
Meteorological and climatological in	avestigation:	[DR81-030178]	p0093 N82-10249
Beview of January - June 1980 inve	estigative period	STENZEL, R. A.	
[DB81-030740]	p0111 N82-12731	Environmental and economic comparison	n of advanced
[DE81-030740] SRINIVASAN, S.	p0111 N82-12731	Environmental and economic comparison Processes for conversion of coal at	
SRINIVASAN, S.	-	processes for conversion of coal a	
SRINIVASAB, S. Design of a cell for electrode kines	tic	processes for conversion of coal aminto clean energy	nd biomass
SRINIVASAN, S.	tic ions	processes for conversion of coal aminto clean energy [PB81-234239]	
SRINIVASAB, S. Design of a cell for electrode kine investigations of fuel cell react:	tic ions p0136 A82-18394	processes for conversion of coal aminto clean energy [PB81-234239] STEPHENS, D. G.	nd biomass p0023 N82-13256
SRINIVASAB, S. Design of a cell for electrode kine investigations of fuel cell react: Design considerations for vehicular	tic ions p0136 A82-18394	processes for conversion of coal aminto clean energy [P881-234239] STEPRENS, D. G. Establishment of noise acceptance critical	nd biomass p0023 N82-13256
SRINIVASAB, S. Design of a cell for electrode kine investigations of fuel cell react: Design considerations for vehicular power plants	tic ions p0136 182-18394 fuel cell	processes for conversion of coal aminto clean energy [PB81-234239] STEPHENS, D. G.	nd biomass p0023 N82-13256 iteria for
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737]	tic ions p0136 A82-18394	processes for conversion of coal as into clean energy [PB81-234239] STEPHEMS, D. G. Establishment of noise acceptance cra wind turbines	nd biomass p0023 N82-13256
SRINIVASAB, S. Design of a cell for electrode kine investigations of fuel cell react: Design considerations for vehicular power plants	tic ions p0136 182-18394 fuel cell	processes for conversion of coal aminto clean energy [P881-234239] STEPRENS, D. G. Establishment of noise acceptance critical	nd biomass p0023 N82-13256 iteria for
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737]	tic ions p0136 182-18394 fuel cell	processes for conversion of coal aminto clean energy [PB81-234239] STEPHEES, D. G. Establishment of noise acceptance crawing turbines STEPHENS, H. S.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825
SRINIVASAB, S. Design of a cell for electrode kine investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S.	tic ions p0136 182-18394 fuel cell p0138 N82-10961	processes for conversion of coal as into clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy,
SRINIVASAB, S. Design of a cell for electrode kine investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a	tic ions p0136	processes for conversion of coal as into clean energy [PB81-234239] STEPHERS, D. G. Establishment of noise acceptance crawind turbines STEPHERS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, , England,
SRINIVASAB, S. Design of a cell for electrode kine investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor	tic ions p0136 182-18394 fuel cell p0138 N82-10961	processes for conversion of coal as into clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England,
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-SRIVASTAVA, V. K.	tic ions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, , England,
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DB81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semic	tic ions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic	processes for conversion of coal as into clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-SRIVASTAVA, V. K.	tic icns p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials	processes for conversion of coal are into clean energy [P881-234239] STEPHERS, D. G. Bstablishment of noise acceptance crewind turbines STEPHERS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHERS, K. Near-term goals for alcohol fuels from	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass:
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-semicond	tic ions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic	processes for conversion of coal are into clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow An overview of resource requirements.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use,
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-insulator-semiconductor properties of narrow and wide gap STARBLER, D. L.	tic ions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from An overview of resource requiremental, and socioeconomic in	p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-semicond	tic icions p0136	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow An overview of resource requirement environmental, and socioeconomic in [DE81-029987]	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use,
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	tic ions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471	processes for conversion of coal as into clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance cr. wind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from the conversion of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-insulator-semiconductor properties of narrow and wide gap STARBLER, D. L.	tic icions p0136	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow An overview of resource requirement environmental, and socioeconomic in [DE81-029987]	p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343	processes for conversion of coal as into clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance cr. wind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from the conversion of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J.	p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semico	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from An overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrose	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-insulator-semiconductor properties of narrow and wide gap STARBLER, D. L. Stability of n-1-p amorphous siliconstall, D. The design of a sodium-cocled 2.7 Metally and the sign of a sodium-cocled 2.7 Metally investigations.	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow An overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrogen as carrier of secondary energy	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	tic ions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from hoverview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrogen as carrier of secondary energine for a research and development process.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-insulator-semiconductor properties of narrow and wide gap STARBLER, D. L. Stability of n-1-p amorphous siliconstable, D. The design of a sodium-cocled 2.7 Mag a solar power plant	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 W receiver for p0059 A82-17126	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow an overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydroden as carrier of secondary energing for a research and development proceedings.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-insulator-semiconductor properties of narrow and wide gap STARBLER, D. L. Stability of n-1-p amorphous siliconstability of	tic icions p0136	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow An overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrough as carrier of secondary energing for a research and development proceedings. The PVIR-MITT-81-10] STEUFENBERG, R. K.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 M82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 Freceiver for p0059 A82-17126 and isotope	processes for conversion of coal at into clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance cr. wind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from the analysis of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrogen as carrier of secondary energing for a research and development proceedings. STEUNERBERG, R. K. Recent progress in lithium/iron sulf:	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	tic icions p0136	processes for conversion of coal arinto clean energy [PB81-234239] STEPHEES, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from a resource requirement environmental, and socioeconomic in [DE81-029987] STERNFEID, H. J. The generation of current from hydroder a research and development proceedings STEUFENBERG, R. K. Recent progress in lithium/iron sulfindevelopment	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semic	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 Freceiver for p0059 A82-17126 and isotope ation p0097 N82-10482	processes for conversion of coal arinto clean energy [PB81-234239] STEPHEES, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from a overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydroden as carrier of secondary energing for a research and development proceedings. ENGLISHEBERG, R. K. Recent progress in lithium/iron sulfit development [DE81-023127]	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-insulator-semiconductor properties of narrow and wide gap starbler, D. L. Stability of n-1-p amorphous siliconstability of n-1-p amorphous siliconstable. STABLER, D. L. Stability of n-1-p amorphous siliconstability of n-1-p amorphous siliconstable. STABL, D. The design of a sodium-cocled 2.7 Mg a solar power plant STABL, W. Development of organic geochemical atechniques for hydrocarbon exploration [BMFT-FB-T-80-076] STAMPER, K. R. Performance characteristics of automatical controls and the properties of automatic characteristics of automatic controls and the properties of automatic characteristics of automatic char	tic tions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 W receiver for p0059 A82-17126 and isotope ation p0097 N82-10482	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance criwind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow An overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrought of the generation of the generation of current fr	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 M82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	tic tions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 W receiver for p0059 A82-17126 and isotope ation p0097 N82-10482	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from a noverview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydroder a research and development proceedings STEUFENBERG, R. K. Recent progress in lithium/iron sulfidevelopment [DE81-023127] STEVELING, E. Geomagnetic and magnetotelluric sound	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-insulator-semiconductor properties of narrow and wide gap starbler, D. L. Stability of n-1-p amorphous siliconstability of n-1-p amorphous siliconstable. STABLER, D. L. Stability of n-1-p amorphous siliconstability of n-1-p amorphous siliconstable. STABL, D. The design of a sodium-cocled 2.7 Mg a solar power plant STABL, W. Development of organic geochemical atechniques for hydrocarbon exploration [BMFT-FB-T-80-076] STAMPER, K. R. Performance characteristics of automatical controls and the properties of automatic characteristics of automatic controls and the properties of automatic characteristics of automatic char	tic tions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 W receiver for p0059 A82-17126 and isotope ation p0097 N82-10482	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance criwind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow An overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrought of the generation of the generation of current fr	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	tic tions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 W receiver for p0059 A82-17126 and isotope ation p0097 N82-10482	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from a noverview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydroder a research and development proceedings STEUFENBERG, R. K. Recent progress in lithium/iron sulfidevelopment [DE81-023127] STEVELING, E. Geomagnetic and magnetotelluric sound	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semic	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 v receiver for p0059 A82-17126 and isotope ation p0097 N82-10482 motive engines s: 1977	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance criwind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from a overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrough as carrier of secondary energing for a research and development proceedings. [DPVLR-HITT-81-10] STEUNENBERG, R. K. Recent progress in lithium/iron sulfice development [DE81-023127] STEVELING, E. Geomagnetic and magnetotelluric sound area of the Central European rift of Empty-PB-T-81-111]	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 W receiver for p0059 A82-17126 and isotope ation p0097 N82-10482 active engines 1977 p0023 N82-13435	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance criwind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from An overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydromatical for a research and development for a research and development proceedings. R. K. Recent progress in lithium/iron sulfice development [DE81-023127] STEVELING, B. Geomagnetic and magnetotelluric sound area of the Central European rift (BMFT-FR-T-81-111] STEVERT, W. A.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 M82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	p0136 182-18394 fuel cell p0138 182-10961 ctor solar cell p0057 182-15911 and electronic materials p0062 182-18471 a solar cells p0043 182-11343 Freceiver for p0059 182-17126 and isotope ation p0097 182-10482 motive engines 1977 p0023 182-13435 Tidal Energy,	processes for conversion of coal arinto clean energy [PB81-234239] STEPHEES, D. G. Establishment of noise acceptance crawind turbines STEPHEES, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHEES, K. Near-term goals for alcohol fuels from a overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFEID, H. J. The generation of current from hydroder a research and development proceedings Bydrogen as carrier of secondary energing for a research and development proceedings STEUJENBEEG, R. K. Recent progress in lithium/iron sulficed development [DE81-023127] STEVELIEG, E. Geomagnetic and magnetotelluric sound area of the Central European rift in [BHFT-PB-T-81-111] STEIBER, W. A. Ecchanically stable hydride composited	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 M82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semiconductor-semiconductor-semiconductor-semiconductor-semiconductor-semiconductor-semiconductor-insulator-semiconductor-in	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 v receiver for p0059 A82-17126 and isotope ation p0097 N82-10482 motive engines s: 1977 p0023 N82-13435 Tidal Energy, e, England,	processes for conversion of coal arinto clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance criwind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from An overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydromatical for a research and development for a research and development proceedings. R. K. Recent progress in lithium/iron sulfice development [DE81-023127] STEVELING, B. Geomagnetic and magnetotelluric sound area of the Central European rift (BMFT-FR-T-81-111] STEVERT, W. A.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656 es designed
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	tic tions p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 Freceiver for p0059 A82-17126 and isotope ation p0097 N82-10482 motive engines s: 1977 p0023 N82-13435 Tidal Energy, e, England, s	processes for conversion of coal as into clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance criwind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow an overview of resource requirement environmental, and socioeconomic in [DE81-029987] STENFFELD, H. J. The generation of current from hydrough as carrier of secondary energing for a research and development proceedings. Recent progress in lithium/iron sulfice development [DE81-023127] STENFELING, E. Geomagnetic and magnetotelluric sound area of the Central European rift (BMFT-PB-T-81-111] STEIERF, W. A. Rechanically stable hydride composite for rapid cycling	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 M82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semico	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 v receiver for p0059 A82-17126 and isotope ation p0097 N82-10482 motive engines s: 1977 p0023 N82-13435 Tidal Energy, e, England,	processes for conversion of coal arinto clean energy [PB81-234239] STEPHEMS, D. G. Establishment of noise acceptance criwind turbines STEPHEMS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge September 23-25, 1981, Proceedings STEPHEMS, K. Near-term goals for alcohol fuels from a noverview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydroder a research and development proceedings Hydrogen as carrier of secondary energing for a research and development proceedings. STEUSEBBERG, R. K. Recent progress in lithium/iron sulfice development [DE81-023127] STEVELING, E. Geomagnetic and magnetotelluric sound area of the Central European rift (BMFT-FB-T-81-111] STEIRET, E. A. Bechanically stable hydride composite for rapid cycling STICKEL, R. E.	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656 es designed p0084 A82-16347
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	p0136 A82-18394 fuel cell p0138 N82-10961 ctor solar cell p0057 A82-15911 and electronic materials p0062 A82-18471 a solar cells p0043 A82-11343 w receiver for p0059 A82-17126 and isotope ation p0097 N82-10482 motive engines s: 1977 p0023 N82-13435 Tidal Energy, e, England, s p0135 A82-18124	processes for conversion of coal arinto clean energy [PB81-234239] STEPHEES, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from a noverview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFEID, H. J. The generation of current from hydrouse the generation of current from hydrouse for a research and development proceedings. Recent progress in lithium/iron sulfidevelopment [DE81-023127] STEVBEINBERG, R. K. Recent progress in lithium/iron sulfidevelopment [DE81-023127] STEVBLING, E. Geomagnetic and magnetotelluric sound area of the Central European rift in [BHFT-FB-T-81-111] STEIRET, H. A. Hechanically stable hydride composite for rapid cycling STICKEL, B. E. Optical diagnostic techniques for coal	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656 es designed p0084 A82-16347
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	policions polici	processes for conversion of coal arinto clean energy [PB81-234239] STEPHEES, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from an overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrode Hydrogen as carrier of secondary energing for a research and development proceedings. Recent progress in lithium/iron sulfice development [DE81-023127] STEVELING, E. Geomagnetic and magnetotelluric sound area of the Central European rift (BHFT-FB-T-81-111] STEVERT, W. A. Mechanically stable hydride composite for rapid cycling STICKEL, R. E. Optical diagnostic techniques for coapplications	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656 es designed p0084 A82-16347 al-fired MBD
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	policions polici	processes for conversion of coal arinto clean energy [PB81-234239] STEPHEES, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from a noverview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFEID, H. J. The generation of current from hydrouse the generation of current from hydrouse for a research and development proceedings. Recent progress in lithium/iron sulfidevelopment [DE81-023127] STEVBEINBERG, R. K. Recent progress in lithium/iron sulfidevelopment [DE81-023127] STEVBLING, E. Geomagnetic and magnetotelluric sound area of the Central European rift in [BHFT-FB-T-81-111] STEIRET, H. A. Hechanically stable hydride composite for rapid cycling STICKEL, B. E. Optical diagnostic techniques for coal	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656 es designed p0084 A82-16347
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	policions polici	processes for conversion of coal arinto clean energy [PB81-234239] STEPHEES, D. G. Establishment of noise acceptance crawind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels from an overview of resource requirement environmental, and socioeconomic in [DE81-029987] STERNFELD, H. J. The generation of current from hydrode Hydrogen as carrier of secondary energing for a research and development proceedings. Recent progress in lithium/iron sulfice development [DE81-023127] STEVELING, E. Geomagnetic and magnetotelluric sound area of the Central European rift (BHFT-FB-T-81-111] STEVERT, W. A. Mechanically stable hydride composite for rapid cycling STICKEL, R. E. Optical diagnostic techniques for coapplications	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656 es designed p0084 A82-16347 al-fired MBD
SRINIVASAB, S. Design of a cell for electrode kiner investigations of fuel cell react: Design considerations for vehicular power plants [DE81-769737] SRIVASTAVA, R. S. A new structure for a semiconductor-insulator-semi	policions polici	processes for conversion of coal as into clean energy [PB81-234239] STEPHENS, D. G. Establishment of noise acceptance criwind turbines STEPHENS, H. S. International Symposium on Wave and 2nd, St. John's College, Cambridge, September 23-25, 1981, Proceedings STEPHENS, K. Near-term goals for alcohol fuels frow an overview of resource requirement environmental, and socioeconomic in [DE81-029987] STENFFELD, H. J. The generation of current from hydrous a research and development proceedings Hydrogen as carrier of secondary energing for a research and development proceedings. Recent progress in lithium/iron sulfice development [DE81-023127] STENFELING, E. Geomagnetic and magnetotelluric sounce area of the Central European rift (BMFT-PB-T-81-111] STEIERF, W. A. Mechanically stable hydride composite for rapid cycling STICKEL, B. E. Optical diagnostic techniques for coapplications [AIAA PAPER 82-0377]	nd biomass p0023 N82-13256 iteria for p0125 A82-11825 Tidal Energy, England, p0135 A82-18124 om biomass: ts, land use, mpacts p0010 N82-11245 gen p0085 A82-17131 rgy: Proposal gram p0087 N82-15542 ide battery p0157 N82-10557 dings in the system p0119 N82-15656 es designed p0084 A82-16347 al-fired MBD

STILES, A. B. Development of superior denitrogenat	ion and
isomerization catalysts for proces	
derived from shale, part 1	0442 900 4945
[AD-A105667] STILLWELL, W. G.	p0113 882-14317
Value tree analysis of energy supply	
[AD-A105629] STOCKEMER, F. J.	p0029 N82-14875
Experimental study of fuel heating a	
temperatures in a wing tank model,	volume 1 p0100 H82-11224
[NASA-CL-165391] STORE, G.	PV100 B02-11224
Spectra over complex terrain	-0440 800 4087
[DE81-028734] STORE, J.	p0112 N82-13473
National photovoltaic program in amo	
[DE81-025906] STONE, J. L.	p0070 N82-11609
Amorphous silicon bibliography - Int	
STRAUS, J. H.	p0053 A82-13737
One-dimensional model of vapor-domin	nated
geothermal systems	************
STREBKOV, D. S.	p0089 A82-11033
Electrical characteristics of high-	
germanium photoconverters under hi illumination intensities	ıgh
	p0040 A82-10391
Cascade photogenerators based on sil germanium matrix photoccnverters	licon and
dermuniam mactiz brococcusercers	p0044 A82-11422
Unconventional techniques of energy	
STREHIER, D.	p0127 A82-13847
Sampling and analysis of potential of	
[PB81-240061] STRICKLAND, G.	p0119 N82-15593
Small-scale uses and costs of hydrog	en derived
from OTEC ammonia	p0084 A82-11792
STROBEL, M. K.	P0004 M02-11/32
Kinetics of wet oxidation of biologic	1 -1 -1
from coal-conversion wastewater to	eatment
from coal-conversion wastewater to [DE82-000525] STROBG, S. J.	reatment p0021 N82-12674
from coal-conversion wastewater to [DE82-000525] STRONG, S. J. Carlisle house: An all-sclar electrons	reatment p0021 N82-12674 ric residence
from coal-conversion wastewater to [DE82-000525] STRONG, S. J. Carlisle house: An all-sclar electropole [DOE/ET-20279/133] STRUMPP, H. J.	reatment p0021 N82-12674 ric residence p0071 N82-11622
from coal-conversion wastewater to [DE82-000525] STRONG, S. J. Carlisle house: An all-sclar electropoly [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a	reatment p0021 N82-12674 ric residence p0071 N82-11622
from coal-conversion wastewater to [DE82-000525] STRONG, S. J. Carlisle house: An all-sclar electropole [DOE/ET-20279/133] STRUMPP, H. J.	reatment p0021 N82-12674 ric residence p0071 N82-11622
from coal-conversion wastewater in [DE82-000525] STROBG, S. J. Carlisle house: An all-sclar electropic [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G.	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302
from coal-conversion wastewater to [DE82-000525] STROBG, S. J. Carlisle house: An all-sclar electropoly [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531]	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302
from coal-conversion wastewater in [DE82-000525] STROBG, S. J. Carlisle house: An all-sclar electric [DOE/ET-20279/133] STRUBPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821]	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302
from coal-conversion wastewater in [DE82-000525] STRONG, S. J. Carlisle house: An all-sclar electric [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER. T. A.	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579
from coal-conversion wastewater to [DE82-000525] STRONG, S. J. Carlisle house: An all-sclar electric [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PE81-218471]	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579
from coal-conversion wastewater in [DE82-000525] STROBG, S. J. Carlisle house: An all-sclar electric [DOE/ET-20279/133] STRUBPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transitermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PB81-218471] SUCLU, D. F.	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14002 smitting p0160 N82-15579 ge p0009 N82-10717
from coal-conversion wastewater in [DE82-000525] STRONG, S. J. Carlisle house: An all-sclar electric [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PB81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 ge p0009 N82-10717
from coal-conversion wastewater in [DE82-00525] STRONG, S. J. Carlisle house: An all-sclar electric [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PB81-218471] SUCIU, D. F. Corrosion testing of carbon steel in geothermal prine [DE81-028653]	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14002 smitting p0160 N82-15579 ge p0009 N82-10717
from coal-conversion wastewater in [DE82-000525] STROWG, S. J. Carlisle house: An all-sclar electric [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transithermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PE81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14002 smitting p0160 N82-15579 re p0009 N82-10717 riaereated p0093 N82-10201
from coal-conversion wastewater in [DE82-000525] STROBG, S. J. Carlisle house: An all-sclar electric [DOE/ET-20279/133] STRUBPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transitermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PB81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T.	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 rep0009 N82-10717 riaereated p0093 N82-10201 rice in
from coal-conversion wastewater in [DE82-000525] STROBG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PB81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDAT, J. H. SUDDATH, J. H.	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 re p0009 N82-10717 ra aereated p0093 N82-10201 rice in p0042 A82-11187
from coal-conversion wastewater in [DE82-000525] STRONG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAN PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKEE, T. A. Energy expenditure and dietary change [PB81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/S/CdS solar cells SUDDATH, J. H. Antenna optimization and cost consideration and cost consideration.	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 re p0009 N82-10717 ri aereated p0093 N82-10201 rice in p0042 A82-11187 retation for
from coal-conversion wastewater to [DE82-00525] STROBG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPF, H. J. Buffer thermal energy storage for a engine [AIAA PAPES 81-2531] STRUSS, B. G. Transwall: A modular visually transt thermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary chang [PB81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/S/CdS solar cells SUDDATH, J. H. Antenna optimization and cost consident the Solar Power Satellite microway	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 re p0009 N82-10717 ri aereated p0093 N82-10201 rice in p0042 A82-11187 retation for
from coal-conversion wastewater in [DE82-000525] STROWG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPES 81-2531] STRUSS, R. G. Transwall: A modular visually transt thermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PE81-218471] SUCIU, D. F. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/s/CdS solar cells SUDDATH, J. H. Antenna optimization and cost consident the Solar Power Satellite microway SUELZLE, L. R.	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 re p0009 N82-10717 ri aereated p0093 N82-10201 rice in p0042 A82-11187 rieration for resystem
from coal-conversion wastewater to [DE82-00525] STROBG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPF, H. J. Buffer thermal energy storage for a engine [AIAA PAPES 81-2531] STRUSS, B. G. Transwall: A modular visually transt thermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary chang [PB81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/S/CdS solar cells SUDDATH, J. H. Antenna optimization and cost consident the Solar Power Satellite microway	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 re p0009 N82-10717 ri aereated p0093 N82-10201 rice in p0042 A82-11187 rieration for resystem
from coal-conversion wastewater to [DE82-000525] STROBG, S. J. Carlisle house: An all-sclar electrical coalists in the coalists of the coalis	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14002 smitting p0160 N82-15579 re p0009 N82-10717 raereated p0093 N82-10201 rice in p0042 A82-11187 riceration for resystem p0145 A82-11744
from coal-conversion wastewater in [DE82-000525] STROWG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transt thermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PE81-218471] SUCIU, D. F. Corrosion testing of carbon steel in geothermal brine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/s/CdS solar cells SUDDATH, J. H. Antenna optimization and cost consident Solar Fower Satellite microway SUELZLE, L. R. The Mt. Laguna photovoltaic project [AIAA PAPEE 82-0065] SUHR, G. Relaxation of geothermal-reservoir selections.	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14002 smitting p0160 N82-15579 re p0009 N82-10717 raereated p0093 N82-10201 rice in p0042 A82-11187 riceration for resystem p0145 A82-11744
from coal-conversion wastewater in [DE82-00525] STROBG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary chang [PB81-218471] SUCIU, D. F. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/s/cds solar cells SUDDATH, J. H. Antenna optimization and cost consident the Solar Power Satellite microway SUELZLE, L. R. The Mt. Laguna photovoltaic project [AIAA PAPEE 82-0065] SUHR, G. Relaxation of geothermal-reservoir sinduced by heat production [DE81-032024]	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14002 smitting p0160 N82-15579 re p0009 N82-10717 raereated p0093 N82-10201 rice in p0042 A82-11187 riceration for resystem p0145 A82-11744
from coal-conversion wastewater to [DE82-000525] STROBG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transt thermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PE81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/S/CdS solar cells SUDDATH, J. H. Antenna optimization and cost considerate Solar Power Satellite microward SUELZLE, L. R. The Mt. Laguna photovoltaic project [AIAA PAPEE 82-0065] SUHR, G. Relaxation of geothermal-reservoir sinduced by heat production [DE81-032024] SULLIVAN, P. W.	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 re p0009 N82-10717 ra aereated p0093 N82-10201 rice in p0042 A82-11187 riceration for resystem p0145 A82-11744 p0061 A82-17762 stresses p0105 N82-11715
from coal-conversion wastewater in [DE82-000525] STROWG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAM PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PB81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/S/CdS solar cells SUDDATH, J. H. Antenna optimization and cost considerate Solar Power Satellite microway SUELZLE, L. R. The Mt. Laguna photovoltaic project [AIAM PAPEE 82-0065] SUHR, G. Relaxation of geothermal-reservoir sinduced by heat production [DE81-032024] SULLIVAN, P. W. Incremental cooling load determination direct gain heating systems	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 ric p0009 N82-10717 ric aereated p0093 N82-10201 rice in p0042 A82-11187 resident for resystem p0145 A82-11744 p0061 A82-17762 stresses p0105 N82-11715 ric for passive
from coal-conversion wastewater in [DE82-000525] STROBG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAA PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transitermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary changes [PE81-029821] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDDAT. Infrared quenching of photocapacital Cu/x/S/CdS solar cells SUDDATH, J. H. Antenna optimization and cost considerate Solar Power Satellite microway SUELZLE, L. R. The Mt. Laguna photovoltaic project [AIAA PAPEE 82-0065] SUHR, G. Relaxation of geothermal-reservoir sinduced by heat production [DE81-032024] SULLIVAM, P. W. Incremental cooling load determinating direct gain heating systems [DE81-029882]	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 re p0009 N82-10717 ra aereated p0093 N82-10201 rice in p0042 A82-11187 riceration for resystem p0145 A82-11744 p0061 A82-17762 stresses p0105 N82-11715
from coal-conversion wastewater in [DE82-000525] STROWG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAM PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PB81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/S/CdS solar cells SUDDATH, J. H. Antenna optimization and cost considente Solar Power Satellite microwate SUELZLE, L. R. The Mt. Laguna photovoltaic project [AIAM PAPEE 82-0065] SUHR, G. Relaxation of geothermal-reservoir sinduced by heat production [DE81-032024] SULLIVAM, P. W. Incremental cooling load determinating direct gain heating systems [DE81-029882] SULOWAY, J. J. Coal fly ash: A review of the liter	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 ric p0009 N82-10717 ric aereated p0093 N82-10201 rice in p0042 A82-11187 resident for resystem p0145 A82-11744 p0061 A82-17762 stresses p0105 N82-11715 ric p0081 N82-15575 ric ature and
from coal-conversion wastewater in [DE82-000525] STROWG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAM PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PE81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/S/CdS solar cells SUDDATH, J. H. Antenna optimization and cost considerate Solar Power Satellite microway SUELZLE, L. R. The Mt. Laguna photovoltaic project [AIAM PAPEE 82-0065] SUHR, G. Relaxation of geothermal-reservoir sinduced by heat production [DE81-032024] SULLIVAM, P. W. Incremental cooling load determinating direct gain heating systems [DE81-029882] SULOWAY, J. J. Coal fly ash: A review of the liter proposed classification system with	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 ric p0009 N82-10717 ric aereated p0093 N82-10201 rice in p0042 A82-11187 resident for resystem p0145 A82-11744 p0061 A82-17762 stresses p0105 N82-11715 ric p0081 N82-15575 ric ature and
from coal-conversion wastewater in [DE82-000525] STROWG, S. J. Carlisle house: An all-sclar electrical [DOE/ET-20279/133] STRUMPP, H. J. Buffer thermal energy storage for a engine [AIAM PAPEE 81-2531] STRUSS, R. G. Transwall: A modular visually transthermal storage wall [DE81-029821] STUCKER, T. A. Energy expenditure and dietary change [PB81-218471] SUCIU, D. P. Corrosion testing of carbon steel in geothermal prine [DE81-028653] SUDA, T. Infrared quenching of photocapacital Cu/x/S/CdS solar cells SUDDATH, J. H. Antenna optimization and cost considente Solar Power Satellite microwate SUELZLE, L. R. The Mt. Laguna photovoltaic project [AIAM PAPEE 82-0065] SUHR, G. Relaxation of geothermal-reservoir sinduced by heat production [DE81-032024] SULLIVAM, P. W. Incremental cooling load determinating direct gain heating systems [DE81-029882] SULOWAY, J. J. Coal fly ash: A review of the liter	reatment p0021 N82-12674 ric residence p0071 N82-11622 solar Brayton p0053 A82-14302 smitting p0160 N82-15579 ric p0009 N82-10717 ric aereated p0093 N82-10201 rice in p0042 A82-11187 resident for resystem p0145 A82-11744 p0061 A82-17762 stresses p0105 N82-11715 ric p0081 N82-15575 ric ature and

SUN, C. Y. Research activities of solar cells in ROC p0047 A82-11795 SUNDBERG, R. E. Boorhead district heating, phase 2 [DE81-029689] p0031 N82-15556 SUEG, R. Sampling and analysis of potential geothermal sites [PB81-240061] p0119 N82-1559 p0119 N82-15593 SUPKOW, D. J.
Aquifer thermal energy storage - A feasibility study for large scale demonstration p0154 A82-11846 SURLES, T. Solid and hazardous energy wastes: Synfuels. 1: Beview of research activities [DE81-028503] p0014 N82-11644 SWAIN, J. C. Extensible bridge-conveyor concepts for coal-mane face haulage p0146 N82-12525 FDE81-0319741 SWALLOM, D. W.

HHD generator scaling analysis for baseload ccmmercial power plants
[AIAA PAPER 82-0394] SWANSON, R. R. Demonstration of Wellman-Lord/Allied Chemical PGD technology: Demontration test second year results [PB81-246316] p0034 N82-15626 SWIFT, A. H. P. Rotor speed control by automatic yawing of two-bladed wind turbines with passive cyclic pitch variation
[AIAA PAPER 81-2570] p0129 A82-14027 Yawing of wind turbines with blade cyclic pitch variation [DE81-030091] p0138 N82-11045 SWIPT, W. M. Studies of the regeneration of activated bauxite used as granular sorbent for the control of alkali vapors from hot flue gas of coal combustion [DB81-030192] p0008 N82-10590 SWISHER, J. Summertime results from the class B passive-solar performance-monitoring program [DE81-025471] p0074 N82-12627 Appliance efficiency and the solar building [DE81-029073] p0075 N82-13265 SWORDER, D. D. The effect of non-Markovian cloud patterns on the design of a regulator for a solar-powered boiler p0052 A82-13083 SYRES, F. G.
Evaluation of shale oil as a utility qas-turbine fuel [DE81-904234] p0107 N82-12251 SZETELA, E. J.

External fuel vaporization study
[NASA-CR-165513] p0114 |
SZYDLOWSKI, R. P.

Transwall: A modular visually transmitting DO 114 N82-14371 thermal storage wall [DE81-029821] p0160 N82-15579 Characteristics of combustion and pollutant formation in swirling flames p0001 A82-10875 TALBOT. J. B. Engineering challenges of fusion-reactor development [DE81-024129] p0139 N82-11907 TANG, Y.-T. Vertical solar cell and internal electric field p0042 A82-11189 TABZAWA, T. Synthetic-fuel combustion; pollutant formation. Soot-Initiation mechanisms in burning aromatics [DE81-029480] p0093 N82-10155

TARHIZERVSKII, B. V.
Prospects for the development of solar energy in the USSR Production of electric power by thermodynamics methods TAYLOR, B. D. G. S. Heat flow studies and geothermal exploration in western Trans-Pecos Texas D0110 N82-12684

TAYLOR, B. J. Fundamental investigations on fuel of	rolls for	THIERE, L. G.	coment for the
transportation applications	CELLS TOI	Jet impingement heat transfer enhanc GPU-3 Stirling engine	ement for the
	p0137 N82-10493	[NASA-TH-82727]	p0140 N82-11993
TAYLOR, G. C. Resource assessment of Low and		THIRRY, R. G. Coal fly ash: A review of the liter	ature and
Moderate-temperature geothermal wa	aters in	proposed classification system wit	
Calistoga, Napa County, California		environmental impacts	-0000 NO3-10600
[DE81-025559] TAYLOR, I. N.	p0109 N82-12518	[PB81-215014] THOMAS, D. L.	p0009 N82-10608
Application of HTGR process heat to	oil shale	Extensible bridge-conveyor concepts	for coal-mine
retorting	p0090 A82-11851	face haulage [DB81-031974]	p0146 N82-12525
TAYLOR, L. T.	po030 202 11031	THOMAS, J. P.	p0140 B02 12323
Development and application of analy		Coal and limestone feed testing for	atmospheric
techniques to chemistry of donor s liquefaction	eor went	fluidized bed combustion [DE81-030629]	p0117 N82-15222
[DB81-029125]	p0099 N82-11166	THOMAS, J. H.	•
Development and application of analy techniques to chemistry of donor s		Ecological effects assessment: Requestate-of-the-art	irements vs
liquefaction	oct venc	[DE81-028092]	p0032 N82-15598
[DE81-025961]	p0099 N82-11167	THOMAS, R. A.	
TAYLOR, R. J. Alternate hybrid power sources for a	cemote site	Cryogenic testing of 100-m supercond transmission test facility	dcfind boset
applications		[DB81-028331]	p0150 N82-13517
[AD-A099471] TAYLOR, B. H.	p0024 N82-13512	THOMAS, R. R. Use of coal cleaning for compliance	with SO2
Development of a solar receiver for	an organic	emission regulations	
Rankine cycle engine	-00/19 392-11900	[PB81-247520]	p0034 N82-15618
TAYLOR, R. W.	p0048 A82-11800	THOMAS, R. L. Energy potential and early operation	al experience
Design and test of two-step solar oi		for large wind turbines	
[DE82-000964] TAYLOR, T., JR.	p0077 B82-13543	THOMPSON, D. S.	p0132 A82-17627
Augmentation of research and analysi		Designing process wells for an under	ground
for timely support of automotive factivities. Volume 1: Summary	fuel economy	coal-gasification environment [DE81-028434]	p0108 N82-12264
[PB81-219479]	p0022 N82-13018	THOMPSOB. W.	p0 100 B02 12204
Augmentation of research and analysi		National interim energy-consumption	survey:
for timely support of automotive factivities. Volume 2: Appendices		Exploring the variability in energ	p0018 N82-12589
[PB81-219487]	p0022 N82-13019	THORE, D. C.	•
Augmentation of research and analysi for timely support of automotive f		A theoretical study of microwave bea by a rectenna	m absorption
activities. Volume 3: Appendix D	·	27 4 20000	p0149 N82-12563
[PB81-219495] TBAGAN, W. P.	p0022 N82-13020	THORNTON, J. A. Sputter-deposited Al203/Ho/Al203 sel	ective
Assessment of I.C. engines as driver	s for heat	absorber coatings	
actuated heat pumps [DB81-024086]	p0139 N82-11421	BUIDOU & 1	p0060 A82-17253
TELES, B.	po135 BOZ 11421	THUROW, T. L. INEL goethermal environmental progra	.n
Thermal storage in salt-hydrates	-0453 303 40040	[DE81-025671]	p0008 N82-10591
Thermodynamic basis for selecting he	p0153 A82-10018 eat storage	TIEN, J. S. Transient catalytic combustor model	
materials	-	[NASA-CR-165324]	p0142 N82-13507
TEMOPOSTE, T. A.	p0153 A82-10019	TIRHOMIROVA, V. A. Electrical characteristics of high-v	oltage
Investigation of photovoltaic mechan	nisms in	germanium photoconverters under hi	
polycrystalline thin-film solar ce	ells p0065 N82-10539	illumination intensities	p0040 A82-10391
TRANKERY, V. J.	potos 202 10333	Cascade photogenerators based on sil	
US ceramic heat exchanger technology	: Status and	germanium matrix photoconverters	=00## 102-11#22
opportunities [DE81-029686]	p0030 N82-15210	TILLER, A. J.	p0044 A82-11422
TENNEY, P. H.		Electrochemical photovoltaic cells	-0066 NO2 40560
Technology of controlled nuclear fus [DE81-027361]	p0144 N82-15893	[DE81-769704] TILLMAH, J. B.	p0066 N82-10568
TEPLIAKOV, D. I.	-	Energy programs at the johns hopkins	university
System of tolerances for a solar-tom	ver power station p0053 A82-13717	Applied Physics Laboratory [PB81-218141]	p0013 N82-11535
TESCHEUER, M.		TIBBOBS, H. L.	· .
Development of organic geochemical a techniques for hydrocarbon explora		The development of high efficiency c cells - An overview	ascade solar
[BMFT-FB-T-80-076]	p0097 N82-10482		p0047 A82-11794
TEVELDE, J. A. External fuel vaporization study		TIPTOB, L. H. Environmental research plan for gas	cunni v
[NASA-CR-165513]	p0114 N82-14371	technologies. Volume 2: Environme	
TRWARY, V. K. Design and testing of a uniformly il	luminating	plan [PB81-222317]	p0011 B82-11274
nontracking concentrator	.eeaana cany	Environmental research plan for gas	•
-	p0042 A82-11209	technologies. Volume 1: Executiv	e summary
THANGARAJ, R. Spectrally selective copper sulphide	coatings	[PB81-222309] TIRAH, J.	p0015 N82-11657
	P0040 A82-10468	Alternative power sources for reside	ntial
THEREZ, P. Silicon and gallium arsenide photovo	ltaic cells -	air-conditioning systems	p0039 A82-10331
Models for the functioning, experi	mentation, and		-
application to concentrating colle	p0055 A82-15006		

TISHCHEBKO, V. A. Study of the electric conductivity of		
		£
fuel combustion products containing	a wea	KTÄ
10Dizing impurity	-0001	100-1000
MYDLDT C W	POOPI	A82-12888
TIWARI, G. W.		
Thermal performance of a solar still	-0050	A82-16229
Optimization of heat losses in normal		
flat-plate collector configurations	- yra	lacic
and performance	- Aua	11212
and berrormance	20059	A82-16744
TRHOMG, C.	P0033	402 (0111
Some characteristics of silicon photo	cells	
fabricated by planar technology		
Inditioning of branch decomposity	n0039	A82-10386
TODD, C. J.	,,,,,	
One viewpoint concerning unit size in	the	
development of wind turkines		
•	p0131	A82-14845
TOMITA, C. Y.		
Ionospheric effects in active retrodi	rectiv	e array
and mitigating system design		
	p0147	N82-12551
The Resonant Cavity Radiator (RCR)		
	p0148	N82-12556
TOMPSON, S.		
Analysis of the energy impacts of the		_
Appropriate Energy Technology Small	. Grant	S
Program: Method and results [DE81-029844]	50020	N82-14651
	P0020	102-14031
TONG, H. Kinetics of NO/ sub x formation during	n earl	17
stages of pulverized-coal combustic		1
[DE81-029071]		N82-11641
Development of a high-temperature dur		
for use in catalytic combustors for		
automotive gas turbine engines		,
[NASA-CR-165396]	p0142	N82-13510
TORRES, R. J.	•	
Kinetics of wet oxidation of biologic	al siu	dqes
from coal-conversion wastewater tre		
(n n 0) . A A A E A E A		
[DE82-000525]	p0021	N82-12674
TORSHIH, A. S.	p0021	N82-12674
TORSHIB, A. S. Effect of inhomogeneous flow distribu	- Ition 1	n a
TORSHÎN, A. S.	tion 1 lector	n a s
TORSHIB, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar columns.	tion 1 lector	n a
TORSHIB, A. S. Effect of inhomogeneous flow distribu system of heat-generating solar col TOSCANO, W. M.	tion 1 lector p0044	n a s A82-11423
TORSHIB, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar col TOSCANO, W. M. Conceptual design of 500 to 3000 hp S	tion 1 lector p0044 Stirlin	n a s A82-11423
TORSHIB, A. S. Effect of inhomogeneous flow distribu system of heat-generating solar col TOSCANO, W. M.	tion 1 llector p0044 Stirlin	n a s A82-11423 g
TORSHIM, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar colors and the stribution of t	tion 1 llector p0044 Stirlin	n a s A82-11423
TORSHIB, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar colors and the second se	tion 1 lector p0044 Stirlin tion p0123	n a s A82-11423 g A82-11807
TORSHIB, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar colorscame, E. M. Conceptual design of 500 to 3000 hp sengines for stationary power general TRACEY, T. R. Development of a solar thermal central	tion 1 lector p0044 Stirlin tion p0123	n a s A82-11423 g A82-11807
TORSHIM, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power generating. TRACRY, I. R. Development of a solar thermal central receiver using molten salt	ition i lector p0044 Stirlin tion p0123	n a s A82-11423 g A82-11807
TORSHIM, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power generating solar. TRACEY, T. R. Development of a solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2]	ition i lector p0044 Stirlin tion p0123	n a s A82-11423 g A82-11807
TORSHIB, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general tracety. I. R. Development of a solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACEY, C. A.	ition illector p0044 Stirlin tion p0123 al heat	n a s A82-11423 g A82-11807
TORSHIB, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar colors of the system of the system of the system of 500 to 3000 hp sengines for stationary rower general tracks, I. R. Development of a solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACK, C. A. Biomethanation of biomass pyrolysis of	ition i lector p0044 Stirlin tion p0123 al heat p0041	n a s A82-11423 g A82-11807 A82-10970
TORSHIM, A. S. Effect of inhomogeneous flow distribution system of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp Sengines for stationary power general stationary power general stationary receiver using molten salt [ASME PAPER 81-SOL-2] TRACEY, C. A. Bromethanation of bromass pyrolysis of [DE82-000238]	ition i lector p0044 Stirlin tion p0123 al heat p0041	n a s A82-11423 g A82-11807
TORSHIW, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of the system of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general stationary power general stationary power general stations. TRACEY, I. R. Development of a solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACY, C. A. Biomethanation of biomass pyrolysis of [DE82-000238] TRAUB. L. G.	ition i lector p0044 Stirlin ition p0123 il heat p0041 yases p0113	n a s A82-11423 g A82-11807 A82-10970
TORSHIB, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of the system of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general stationary g	ttion 1 llector p0044 Stirlin stion p0123 al heat p0041 pases p0113	n a s A82-11423 9 A82-11807 A82-10970 N82-13541
TORSHIN, A. S. Effect of inhomogeneous flow distributions system of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general stationary power general stationary flower general stations. TRACRY, I. R. Development of a solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACI, C. A. Blomethanation of blomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAND, R.	ition i llector p0044 Stirlin ttion p0123 al heat p0041 yases p0113	n a s
TORSHIN, A. S. Effect of inhomogeneous flow distributions system of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general stationary power general stationary flower general stations. TRACRY, I. R. Development of a solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACI, C. A. Blomethanation of blomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAND, R.	ition i llector p0044 Stirlin ttion p0123 al heat p0041 yases p0113	n a s
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating for stationary power generating of the solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACY, C. A. Biomethanation of biomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471]	tition inclication pools training policition policitii pol	n a s
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general stationary power general stationary fower general stationary for stationary fo	tition inclication pools training policition policitii pol	n a s
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general sta	tition inclination of the control of	n a s 82-11423 9 A82-11807 A82-10970 N82-13541 N82-10717 Volume N82-15589
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACY, C. A. Blomethanation of blomass pyrolysis of [DB82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central American and Service of the heat-generating past-231540] Energy and development in Central American and develop	tition inclination pools in the	n a s
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACY, C. A. Biomethanation of hiomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central American 1: Regional assessment [PB81-231540] Energy and development in Central American and development in Central American 2: Country assessments [PB81-231557]	tition inclination pools in the	n a s 82-11423 9 A82-11807 A82-10970 N82-13541 N82-10717 Volume N82-15589
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp Stationary power general sense. TRACRY, T. R. Development of a solar thermal central receiver using molten salt [ASHE PAPER 81-SOL-2] TRACY, C. A. Biomethanation of biomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central American 1: Regional assessment [PB81-231540] Energy and development in Central American 2: Country assessments [PB81-231557] TREET, B. C.	ttion inclination pools and heat pools and heat pools are pools ar	n a s 82-11423 g 882-11807 A82-10970 N82-13541 N82-10717 volume N82-15589 volume N82-15590
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general stationary power general stationary power general stationary flower general station of a solar thermal central flower papers and station of biomass flowers general station of biomass f	tition inclination pools and heat pools and heat pools are pools a	n a s 882-11423 9 882-11807 882-10970 882-13541 882-10717 Volume 882-15589 Volume 882-15590 f
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general stationary power general stationary power general stationary flower general station of a solar thermal central flower papers and station of biomass flowers general station of biomass f	tition inclination pools and heat pools and heat pools are pools a	n a s 882-11423 9 882-11807 882-10970 882-13541 882-10717 Volume 882-15589 Volume 882-15590 f
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACY, C. A. Biomethanation of hiomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central American and	ttion illector p0044 Stirlin ttion p0123 Il heat p0041 Jases p0113 p0009 prica. p0032 prica. p0032 piound action	n a s 842-11423 9
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar thermal central receiver using molten salt [ASHE PAPER 81-SOL-2] TRACEY, C. A. Bomethanation of biomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central Amelia Regional assessment [PB81-231540] Energy and development in Central Amelia (PB81-231557) TREMT, B. C. Computer models to support investigate surface subsidence and associated of induced by underground coal gasific	ttion illector p0044 Stirlin ttion p0123 Il heat p0041 Jases p0113 p0009 prica. p0032 prica. p0032 piound action	n a s 882-11423 9 882-11807 882-10970 882-13541 882-10717 Volume 882-15589 Volume 882-15590 f
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general sengines for stationary sengines for support s	pood pround action pools	n a s 882-11423 9
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACY, C. A. Blomethanation of blomass pyrolysis of [DE82-00238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central American and development in C	pood pround action pools	n a s 882-11423 9
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general sengines for stationary sengines for support s	poods poods poods starling tion polica all heat poods polica polica poods prica poods prica poods prica poods prica poods poods prica poods prica poods poods poods poods poods poods poods prica poods poods poods poods prica poods pood	n a s 882-11423 9
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar solar thermal central receiver using molten salt [ASHE PAPER 81-SOL-2] TRACEY, C. A. Bowelopment of a solar thermal central receiver using molten salt [ASHE PAPER 81-SOL-2] TRACEY, C. A. Bomethanation of biomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central Amederical in the second session of the second second session of the second second session of the second	poods poods poods starling tion polica all heat poods polica polica poods prica poods prica poods prica poods prica poods poods prica poods prica poods poods poods poods poods poods poods prica poods poods poods poods prica poods pood	n a s 882-11423 9
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar colors. TOSCANO, W. M. Conceptual design of 500 to 3000 hp sengines for stationary power general sending solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACEY, T. A. Blomethanation of blomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central American 1: Regional assessment [PB81-231540] Energy and development in Central American 1: Country assessments [PB81-231557] TREMT, B. C. Computer models to support investigate surface subsidence and associated of induced by underground coal gasification [DE81-027131] TRESTER, P. W. The GA sulfur-iodine water-splitting status report TREXLER, D. T.	tition inclination process pooluber to the control of the control	n a s 882-11423 9
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACY, C. A. Biomethanation of hiomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central American and the heat-generating sessment [PB81-231540] Energy and development in Central American and dietary change [PB81-231557] TRENT, B. C. Computer models to support investigate surface subsidence and associated of induced by underground coal gasific [DE81-027131] TRESTER, P. W. The GA sulfur-iodine water-splitting status report TREXIER, D. T. Low-to-moderate temperature geothermal	tition inclination inclination in the control of th	n a s 882-11423 9
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar thermal central receiver using molten salt [ASHE PAPER 81-SOL-2] TRACK, C. A. Biomethanation of biomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central American and the second colors of heat-generating second colors of heat-generating second colors of heat-generating surface subsidence and associated of induced by underground coal gasification (DE81-027131) TRESTER, P. W. The GA sulfur-iodine water-splitting status report TREXIER, D. T. Low-to-moderate temperature geotherm assessment for Nevada, area specifical colors of the second color	tition inclination inclination in policition in the policition in policition in policition in policition in policition policition in policition in policition in the policitio	n a s 882-11423 g 882-11807
TORSHIW, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACKY, C. A. Blomethanation of biomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central Amederical solar of heat-generating sensitive subsidence and associated of induced by underground coal gasification [DE81-03157] TRESTER, P. W. The GA sulfur-iodine water-splitting status report TREXIER, D. T. Low-to-moderate temperature geothermal assessment for Nevada, area specifical pressures.	tition inclination inclination in policition in the policition in policition in policition in policition in policition policition in policition in policition in the policitio	n a s 882-11423 9
TORSHIN, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACKY, C. A. Blomethanation of hiomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central American and de	tition in lettion in lettion pool of the start in p	n a s 82-11423 9
TORSHIW, A. S. Effect of inhomogeneous flow distribut system of heat-generating solar colors of heat-generating solar thermal central receiver using molten salt [ASME PAPER 81-SOL-2] TRACKY, C. A. Blomethanation of biomass pyrolysis of [DE82-000238] TRAUB, L. G. Energy expenditure and dietary change [PB81-218471] TREHAN, R. Energy and development in Central Amederical solar of heat-generating sensitive subsidence and associated of induced by underground coal gasification [DE81-03157] TRESTER, P. W. The GA sulfur-iodine water-splitting status report TREXIER, D. T. Low-to-moderate temperature geothermal assessment for Nevada, area specifical pressures.	tition in liction in licein in licein in licein in liction in licein	n a s 82-11423 9

Coal gasifier parameters influencing environmental pollutant production [PB81-221301] p0011 N82-1127

p0011 N82-11273

TSANG, C. P.
Study of ATES thermal behavior using a steady flow model [DE81-0308831 TSAUR, B .- Y. Efficient Si solar cells by low-temperature solid-phase epitary D0043 A82-11344 TSUI, M. E. Aluminum recovery from fly ash and shale-retort wastes [DE81-027675] D0099 N82-11154 TULLY, N. Simple tracking strategies for solar concentrations p0042 A82-11207 Efficient Si solar cells by low-temperature solid-phase epitaxy p0043 A82-11344 TURNER, R. R. Coal conversion solid waste disposal [DE81-028567] p0116 N82-14680 TURNER, W. D. Mississippi County Community College solar photovcitaic project [DE81-030669] p0068 N82-11554 TYAN, K. A. Some characteristics of silicon photocells fabricated by planar technology p0039 A82-10386 UGAI, M. Nonlinear development of magnetic reconnection in the tearing-type and the Petschek-type field geometries OHERKA, K. L.
Overview of DOE's large stationary Stirling engine development program D0123 A82-11805 ULLMAN, J. Ground-mounted thermal storage for the parabolic dish solar collector/Stirling engine system p0047 A82-11781 ULMISHEK, G. Petroleum geology and resource assessment of the middle Caspian Basin, USSR, with special emphasis on the Uzen field [DE81-029951] p0104 N82-11518 UNGVARSKY, J.
Pulsed Power Research colloquium [AD-A105770] p0150 N82-14638 UPSON, C. D. Three-dimensional, finite elemental model for simulating heavier-than-air gaseous releases over variable terrain [DE81-028689] D0032 N82-15602 VACHON, W. A.

Large wind turbine generator performance assessment, technology status report no. 3
[DE81-903763] p0137 N82-10524 [DE81-903763] VAGTS, K. National interim energy-consumption survey: Exploring the variability in energy consumption [DE81-029910] p0018 N82-12589 VAJK, J. P. Application of solar power satellites to India's energy needs - A macroengineering solution to a macroproblem p0062 A82-18645 VALAYAPETRE, M. Characterization of selective solar absorber microstructures - Electron microscope studies D0060 A82-17254 VALCO, G. J.
Hultijunction high voltage concentrator solar cells p0047 A82-11796 High power solar array switching regulation p0045 A82-11736 VAN BIBBER, L. B. An evaluation of alternate system configurations for solar repowering electric power plants

p0048 A82-11803

VANDERWALL, B. M.		VITTITOE, C. H.	_
Study of gelled LNG	**************************************	User's guide to HELIOS: A computer p	
[DE81-023259] VARHOUB, K. R.	p0095 N82-10269	modeling the optical behavior of resolar concentrators. Part 1: Into	
Potential contribution of currently		code input	
nuclear-fueled electric-generating reducing US cil consumption	units to	[DE81-031920] VOGLER, B. A.	p0073 N82-12616
[DE81-030497] VANVALIM, C. C.	p0031 N82-15553	Comparison of Michigan Basin crude of	lls p0091 A82-17007
Environmental effects of rellutants a combustion. 2: The Colstrip, Mon-		VONBRIESEN, R. Energy programs at the johns hopkins	university
[PB81-234114]	p0026 N82-13573	Applied Physics Laboratory	
VASILEY, V. V. Optimum reinforcement shapes and path	hs for	[PB81-218141] VOESCHOEFELDT, H.	p0013 N82-11535
rotating composite shells	p0154 A82-14513	Controlled-flash pyrolysis [DE82-000284] VONWINTERPELDT, D.	p0111 N82-13196
VAUTE, R. Botating regenerative heat exchanger	for energy	Value tree analysis of energy supply	
recovery in chemical plants [BMPT-PB-T-81-099]	p0030 N82-15367	VOSS, E.	p0029 N82-14875
VERRS, P. Residual stresses in darrieus vertica	al axis wind	Recent advances in lead-acid cell res development	search and
turbine blades	p0136 N82-10434	[DE81-023104]	p0158 N82-11580
VENKATES WAR, R.		w	
Thermophysical properties of coal lig [DE81-0279446]	guids p0097 N82-10938	WADE, W. H.	
VERDUE, H. R.	-	Tertiary oil recovery processes resea	irch at the
Technical and economic assessment of thermophotovoltaic conversion	solar	University of Texas [DE81-025222]	p0096 N82-10477
[DB81-803762]	p0064 N82-10515	WADEKAMPER, D. C.	· .
VERMEULEN, T. Oxydesulfurization of coal by acidic	iron culfato	Application of HTGR process heat to o	oil shale
solutions		-	p0090 A82-11851
[DE82-000464] VERWEIJ, A.	p0106 N82-12199	V205-Si photovoltaic cells	
Pollution of the soil by aviation gas		- HART TO M	p0051 A82-12824
[PHL-1979-41] VIELSTICH, H.	p0032 N82-15596	Controls for solar heating and cooling	1 g
Electrodes and diaphragms for fuel co		[DE81-025209]	p0070 N82-11593
[BMPT-PB-T-81-047] VIGERSTAD, T. J.	p0143 N82-14666	Overview of active solar absorption/P cooling program	dankine
Residual-energy-applications program	environmental	[DE81-028041]	p0082 N82-15577
analysis report [DE81-027538]	p0024 N82-13525	NALDON, C. A. An overview of fatigue failures at the	ne Rocky Flats
VIKTOROVITCE, P. Carrier-collection efficiencies in a		Wind System Test Center	p0125 A82-11828
hydrogenated silicon Schottky-barr		Evaluation of wind turbine generator	
VILAHAJO, E.	p0042 A82-11185	hysteresis using 'Method of Bins'	p0133 A82-17636
Numerical simulation of sclar cell of	pen circuit	WALKER, D. H.	•
voltage decay	p0041 A82-10658	Design and development of a reciprocation low-temperature freon expander	iting
Investigations of the OCVD transient:	s in solar cells	[DE81-028609]	p0023 N82-13392
WINCRESIEL P.	p0043 A82-11334	WALKER, R. D. Design study of a continuously varial	ole roller
Energy and ceramics		cone traction CVT for electric webi	icles
VINEBERG, E.	p0005 A82-17076	[NASA-CR-159841] WALL, J. D.	p0159 N82-12445
The corrosion of some superalloys in		Hississippi County Community College	solar
coal chars in coal gasifier atmosp	p0091 A82-17974	photovcltaic project [DE81-030669]	p0068 N82-11554
VINOGRADOV, A. P.		WALLIE, M. Sulfur in the air in the capital (Hel	laimhel
Increasing power and efficiency by dy suppression of ionization instabil:		metropolitan area: ITASAT-project	.SIUKI)
VISENTIE, R.	P0127 A82-12897	[RR-614.71] WALTER, R. J.	p0025 N82-13553
A simplified model of the thermohydra	aulic	Test results and facility description	for a
behaviour of a linear collector ne- conversion of the solar energy	twork for the	40-kilowatt stirling engine [NASA-TM-82620]	p0141 N82-13013
conversion of the solut energy	p0062 A82-18816	WALTERS, B. A.	•
VITALE, B. G. Development free-piston Stirling test	t-hed engine	Assessment of water supply contaminat underground coal gasification	ion due to
•	p0123 A82-11808	[PB81-209215]	p0021 N82-12680
VITELLO, J. J. Baseline data on utilization of low-	grade fuels in	WALTERS, E. C. Evaluating R and D options under unce	ertainty.
gas turbine applications. Volume		Volume 2: Atmospheric fluidized-be	
component corrosion evaluation [DE81-903760]	p0094 N82-10253	commercialization strategies [DE81-904246]	p0035 N82-16012
VITKO, J., JR. Solar-central-receiver fuels and che	micale	Evaluating R and D options under unce Volume 3: An electric-utility	ertainty.
[DE82-000941]	p0077 N82-13530	generation-expansion planning model	
VITRY, D. Economic effects induced by ESA conti	racte phace	[DE81-904237] WANG, C. C.	p0035 N82-16013
Volume 1: Summary		Thermionic combustor application to o	ombined gas
[ESA-CR(P)-1462-VOL-1]	p0161 N82-14981	and steam turbine power plants	n0124 182-11818

WANG, J. H.	-	
Computational tools for pulverized-co		
[DE81-028582] WANG, K. L.	povso	N82-11148
High efficiency thin-film Gals solar	cells	
		A82-11767
WANG, S. Y.		
End region and current consclidation	effect	s upon
the performance of an MAD channel i	or the	ETP
conceptual design [AIAA PAPER 82-0325]	20135	A82-17889
End region and current consciidation		
the performance of an MBD channel i		
conceptual design		
[NASA-TM-82744]	p0141	N82-12943
WANGEN, L. E.		
Chemical element concentrations in li solids associated with rower plants		
systems	using	IGD
[DE81-030422]	p0027	N82-14322
WARCHOL, E. J.	•	
Application of large and small wind	turbine	•
generators - A utility perspective	-0433	.00 43650
WARNER, A. J.	p0 133	A82-17629
	ie oıl	
potential from known deposits		
[DE81-027023]	p0096	N82-10474
WARBER, I. M.		
Identification and toxicity of		
fractionated-shale-oil components	D0021	NO2-12766
[DE81-028460] WARNER, R. H., JR.	P0021	N82-12766
The contoured-oxide monolithic series	-array	solar
battery	•	
	p0042	A82-11190
WARREN, J. L.		-
Research opportunities in new energy- materials	·rerate	a
Maretials	p0161	A82-15377
WARREN, M.	F	13377
Controls for solar heating and cooling	ıg	
[DE81-025209]		N82-11593
Overview of active solar absorption/	ankıne	
cooling program	20000	NO 15577
[DE81-028041] WASAN, D.	povoz	N82-15577
Separation of particles from coal der	uved 1	.iounds
via surface charge properties		
[DE81-029088]	p0092	N82-10141
WATANASIRI, S.		
Development of a thermodynamic proper correlation framework for the coal		CLOR
industry, phase 1A	COTAGE	5101
[DE81-030363]	p0111	N82-12985
WATERBURY, G. R.	-	
Environmental and radiclogical safety	studi	es:
Interaction of (238) Pu02 heat sour	ces Wi	th
terrestrial and aquatic environment [DE81-032019]		N92-12565
WATERMAN, J.	P0023	N82-13565
Geomagnetic and magnetotelluric sound	lings i	n the
area of the Central European rift s	ystem	
[BMFT-FB-T-81-111]	p0119	N 82-15656
WATKINS, D. R.		
Gas recovery from coal deposits [PB81-222291]	n0103	N82-11271
WATSON, A. P.	Poios	802-11271
Energy analysis of human ecosystems i	n an	
Appalachian coal county		
[DE81-025177]	p0013	N82-11574
WATSON, K.		
Geologic applications of thermal-iner	tia ma	pping
from satellite [E82-10011]	n0118	N82-15489
WAYLAND, J. R.	PULLO	802-13403
Project DEEP STEAM: Fourth meeting of	f the	
technical advisory panel		
[DE81-029457]	p0144	พ82-15561
WAYNE, W. W., JR.		
North American tidal power prospects	n0124	1 92_ 1 E C C T
WEAVER, W. R.	1 C1 04	A82-15667
A solar simulator-pumped gas laser for	r the	direct
conversion of sclar energy		
	p0044	A82-11710
WEBER, R. E.		
Development of battery separator comp [NASA-CR-165508]		N82-11547
[20121	MUL 1134/

```
WEBBER, S. L.
Kinetics and catalysis of producing synthetic
     gases from biomass
     [ PB81-217614]
                                              p0095 N82-10272
WEEKES, M. C.
   Environmental and economic comparison of advanced
     processes for conversion of coal and biomass
      into clean energy
     ſ PB81-2342391
WEGRZYN, J.
   Real-time coarse-particle mass measurements in a
     high-temperature/pressure coal-gasifier process
      treatment
      [ DE81-030039 ]
                                              p0119 N82-15604
   Real time coarse particle mass measurements in a
      high temperature and pressure coal gasifier
      process treatment
      [DE81-030036]
                                               D0033 N82-15609
DEHNER, H.
   Development of organic geochemical and isotope techniques for hydrocarbon exploration [BMFT-FB-T-80-076] p0097 N82
                                              p0097 N82-10482
WEHOWSKY, P.
   Gas cooled solar power plant for generating
      electrical energy in the 20mme operating range
      (GAST): Preliminary design phase
      [BMF1-FB-T-81-097]
                                              p0080 N82-15530
WEINBERG, I.
   Gallium arsenide solar cells-status and prospects
      for use in space
                                              p0046 A82-11765
WRINBERG, M.
   Energy conservation in distillation [DE81-028650]
                                              p0018 N82-12581
WEINSTEIN, R. B.
   Assessment of MHD power plants with coal
      gasification
     [AIAA PAPER 81-2574]
                                              p0129 A82-14030
PRIRICK, L. J.
Project DEEP STEAM: Fourth meeting of the
     technical advisory panel
     [DE81-029457]
                                              p0144 N82-15561
WEISS, A. H.
   Kinetics and mechanisms of catalytic
hydroliquefaction and hydrogasification of lignite
[DE81-023581] p0092 N82-10144
WEISS, L. S.
   SOLPLAN report: An assessment of barriers and
     incentives to conservation and
      alternative-energy use in the residential sector
      in Wisconsin
     [ DOE/CS-30292/3]
                                              p0013 N82-11614
WEISS, M. F.
Evaluation of the micro-carburetor
     [NASA-CR-164958]
                                              p0016 N82-11994
WEISS, R. M.
   International energy indicators
     [DE81-028117]
                                              p0028 N82-14653
WEIZENKAMP, H.
   The design of a sodium-cooled 2.7 MW receiver for
     a solar power plant
                                              D0059 A82-17126
   Environmental effects of pollutants from coal combustion. 2: The Colstrip, Montana Power Plant [PB81-234114] p0026 N82-13573
WELLMAN, D. L.
WELLMAN, K.
   The properties of solar and heat pump heating systems of small houses and additional heat
      sources
     [ VT1-56]
WELLS, J. W.
Tennessee Valley Authority atmospheric
     fluidized-bed combustor simulation
                                              p0098 N82-11151
     [DE81-030262]
WELLS, M. A.

Coal resources and sulphur emission regulations:
     A summary of 8 eastern and midwestern states
     [ PB81-240319]
                                              D0031 N82-15514
WELLS, P. B.
   Molten salt thermal energy storage subsystem for
     Sclar Thermal Central Receiver plants
   Wing design for light transport aircraft with
     improved fuel economy
                                              p0004 A82-14416
```

WENDERHOLD, H.	WINE, C. B.
Aging and corrosion problems with flat solar	REPEAT facility. Report for May, June, July
energy absorbers. Study based upon literature and experiment exchanges	[DE81-028156] p0079 N82-14665 WINSBERG, S.
[SF-EAPP-1979/4] . p0077 N82-13548	
Pulverized-coal firing of aluminum melting furnaces [DOE/CS-40037/T2] p0095 882-10262	WINSTON, R.
WESTERDAHL, B. B.	in space
Chronic exposure of a honey bee colony to 2.45 GHz continuous wave microwaves	p0046 A82-11761 Integrated function nonimaging concentrating
p0003 A82-14347	collector tubes for solar thermal energy [DE81-029677] p0064 #82-10521
Asymmetric stress and failure analysis [DE81-026842] p0142 N82-13451	WIRTHWEIN, H. J. G.
WHERLER, M. G.	of the operational results from heat pump plants
Hydrogen storage-bed design for tritium systems test assembly [DR] 1022361	[BMFT-FB-T-80-109] p0032 M82-15583
[DE81-025336] p0086 H82-11262 WHITE, L. R. Industrial applications of MHD high temperature	Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels
air heater technology	[DOE/ET-14700/1] p0102 N82-11259
[AIAA PAPER 81-2588] p0130 A82-14037	Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid
Parametric sensitivity study for solar-assisted heat-pump systems	and hydrogenation of CO to produce fuels [DOE/ET-14700/2] p0102 N82-11260
[DE81-030309] p0067 M82-11407	WISSLER, R.
Parties, R.	Puel savings in hot water heating plants by
Effects of heat treatment on epitaxial silicon solar celis on metallurgical silicon substrates p0058 A82-16469	application of heat pumps operated with natural gas (natural gas heat pump). Project: gas engine [BMFT-PB-T-80-125] p0020 N82-12641
WICK, O. J.	WITTGEN, P. P. H. H.
Comparison of potential radiological consequences from a spent-fuel repository versus	Solar power systems smaller than 500 W for military use
natural-uranium deposits	[FML-1980-06] p0080 N82-15534
[DE81-028232] p0029 N82-14910 WIENER, D. B.	WITTNEBEL, R. Identification and toxicity of
SOLPLAN report: An assessment of barriers and incentives to conservation and	fractionated-shale-oil components [DB81-028460] p0021 N82-12766
alternative-energy use in the residential sector in Wisconsin	WOHLGRHOTH, J. H. Thin cells - Their present status and future areas
[DOE/CS-30292/3] p0013 N82-11614 WIESMETH, A.	
Improvement of thermal efficiency of flat plate solar collectors	Silicon solar cell optimization [AD-A106005] p0076 N82-13514
[BMFT-FB-T-80-194] p0075 N82-12642	WOJKOWSKY, H.
WIKOPP, P. M. Corrosion testing of carbon steel in aereated	The generation of current from hydrogen p0085 A82-17131
geothermal brine	BOLAK, P.
[DE81-028653] p0093 N82-10201 FILBANKS, T. J.	Regional-issue identification and analysis, high
Building a consensus about energy technologies [DB82-000501] p0024 N82-13536	scenario [DE81-026425] p0016 H82-11988
WILDHAM, G. C.	WOLF, D.
Improved polymers for enhanced oil recovery synthesis and rheology	Organic fluids for the practical use in energy conversion systems of solar power plants
[DE81-030194] p0118 N82-15509	
WILHRIM, W. G.	WOLP, T.
Low-cost solar flat-plate-collector development [DE81-025081] p0070 N82-11584	Pulverized-fuel combustion: Modeling and scaleup methodologies
WILEBLUSEB, S.	[DE81-026546] p0093 N82-10158
Oll spill identification by chemical analysis p0115 882-14583	NOLFE, W. P. An indoor blade test facility for determining the
WILKEBING, H. A., JR. AMI Corporation receiver design experience in	<pre>tasic aerodynamic properties of Darrieus wind turbine airfoils with test results for an NACA</pre>
concentrating sclar ccllectors	0015 and a modified section
[ASHE PAPEE 81-SOL-1] p0041 A82-10969 WILLIAMS, J. G.	p0136 N82-10005
Mississippi County Community College solar photovoitaic project	The generation of current from hydrogen p0085 A82-17131
[DE81-030669] p0068 N82-11554	
WILLIAMS, R. Stability of n-i-p amorphous silicon solar cells p0043 A82-11343	Solar data base management system p0066'N82-10952 p0066'N82-10952
WILLIAMS, R. L.	An experimental study of SO3 dissociation as a
Informational report on the measurement and characterization of diesel exhaust emissions	mechanism for converting and transporting solar energy
[PB81-221251] p0009 N82-11175	p0043 A82-11214
WILSON, R. Energy for the year 2000 p0006 A82-18120	MOOD, C. Advanced high temperature thermoelectrics for
WIMMER, J. H.	space power . p0125 A82-11823
Ceramics for the AGT101 automotive gas turbine p0132 A82-16827	WOOD, D. O. Annual review of energy. Volume 6
WINKER, C. D.	p0001 A82-11540
Structural evolution of three	WOODCOCK, G. R.
geopressured-geothermal areas in the Texas Gulf Coast	SPS phase control studies p0147 N82-12549
[DB81-029799] p0118 #82-15505	

n0149 N82-12561

Rectenna system design

Modified reference SPS with solid state	,
transmitting antenna	YEN, W. W. S.
p0149 N82-12566 WOODRUFF, E. S.	GRAD: A too monitoring
Techniques for geothermal liquid sampling and	(DE81-0280
analysis	IBSAVAGE, V. P.
[DE81-030151] p0098, N82-11149 HOODWARD, J. B.	Enthalpy mea [DE81-0294
Design, cost and performance comparisons of	YIH, Y. G.
several solar thermal systems for process heat.	Bnvironmenta
Yolume 1: Executive summary [DE81-029881] p0069 N82-11576	processes into clean
WOOLSEY, N. P.	[PB81-2342
Chemistry of lignite liquefaction	INGVE, P. W.
[DE81-030178] p0093 N82-10249 WORKHOVEN, R. N.	Residual-ene EAST-facil
Performance testing of the TOLTEC II-410	: [DB81-0274
concentrating sclar collector	Residual-ene
[DE81-029994] p0071 882-11617	facility r
National interim energy-consumption survey:	[DE81-0275
Exploring the variability in energy consumption	Silicon sola
[DE81-0299 10] p0018 #82-12589	fabricatio
WRAY, W. O. Passive-solar-retrofit study for the United States	[NASA-CR-1 YOUNDS, L. G.
Navy	Geophysical
[DE81-028921] p0074 N82-12629	California
PRIGHT, H. B., JR. Development of peatlands in northern Minnesota	low- and m
[DE82-000873] p0112 N82-13475	resource a [DE81-0260
WRIGHT, J. D.	YOUNG, D. C.
Design and economics of direct-contact salt	Investigatio
hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558	in coal hy [DE81-0304
WRIGHT, M. C.	YOUNG, D. L.
The evaluation of four solar-array-powered	Fluidized be
multi-kW power conditioners for Space Shuttle	[NASA-CASE
Orbiter application p0046 182-11772	YOUNG, W. B. Development,
NU, CY.	materials
An analytical model for high-low-emitter /HLE/	Executive
solar cells in concentrated sunlight p0055 182-15441	[DE81-0262 YOUNGER, F. C.
WU. S. P.	Dynamic stab
Conceptual design of an advanced water/steam	[DE81-0300
receiver for a solar thermal central power system [ASME PAPER 81-SOL-5] p0042 A82-10973	YOUNGS, L. G. Resource ass
WU, Y. C. L.	Moderate-t
Two-dimensional effects in power take-off region	Calistoga,
[DE82-000091] p0141 N82-13367	[DB81-0255
FUERDENAN, D. Parallel evaluation of air-and oxygen-activated	IU, J. Asymmetric s
sludge ,	(DE81-0268
[PB81-246712] p0034 882-15633	YU, J. H.
NUBSCH, P. K. Investigation of direct solar-to-microwave energy	· Thin-film ga
conversion techniques	YOUT, F.
[NASA-CR-161883] p0067 N82-11544	Parallel eva
WYETH, N. C. Technical and economic assessment of solar	sludge
thermophotovoltaic conversion	[PB81-2467
[DE81-803762] p0064 N82-10515	
WYMAN, C. B.	GARARGET A R
SERI Solar-Energy-Storage Program [DE81-029476] p0082 N82-15576	ZABORSKY, O. R. Biomass conv
[220, 605, 60]	210102 0011
y · .	ZAININGER, H. W
YAMABAWA, K. A.	Potential dy utility sy
The effects of impurities on the performance of	4011101 31
silicon solar cells	ZAKHABOVA, O. P
[NASA-CR-164945] p0067 N82-11548	Experimental solar conc
YANG, H. 1. Laser bonded n-Gals/p-GaSb heterojunction	SOIAL COME
intercell Ohmic contact	ZAKHIDOV, R. A.
p0041 A82-10776	Investigațio
YAO, H. P. Near-term batteries for electric vehicles	particles
[DE81-023543] p0157 N82-10556	Efficiency o
Status of nickel/zinc and nickel/iron battery	collectors
technology for electric vehicle applications [DE81-023572] p0157 N82-10962	718U5D B ,b .
[DE81-023572] p0157 N82-10962 YEARGAN, J. R.	ZABDER, F. H. Residual-ene
Hississippi County Community College solar	EAST-facil
photowoltaic project . [DE81-030669]	[DE81-0274

YBH, Y. C. H. High efficiency thin-film Gals solar cells p0046 A82-11767 l for program analysis and progress p0120 N82-15981 surement of coal-derived liquids p0097 N82-10939 al and economic comparison of advanced for conversion of coal and biomass energy 39] p0023 N82-13256 rgy-applications program: ity requirements document p0014 N82-11616 ergy-application program: EAST equirements document, volume 1 p0142 N82-13526 r cell process development, on and analysis 163787] p0063 N82-10500 survey, Paso Robles geothernal area, , part of the resource assessment of oderate-temperature geothermal reas in California 38] n of mechanisms of hydrogen transfer drogenation p0099 N82-11165 92] d coal combustion reactor -NPO-14273-1] p0097 N82-11144 testing, and evaluation of MHD and component designs. Volume 1: summary 03] p0139 N82-11947 ility of stacked disk type flywheels p0156 N82-10535 08] essment of Low and emperature geothermal waters in Napa County, California p0109 N82-12518 tress and failure analysis 421 p0142 N82-13451 llium arsenide homojunction solar cells p0052 A82-13200 aluation of air-and oxygen-activated 12] p0034 N82-15633 Z ersion processes for energy and fuels p0092 182-18114 namic impacts of wind turbines on stems p0131 A82-15071 investigation of parabolic-cylinder entration with tubular heat receiver p0040 A82-10389 on of abrasive action of atmospheric on the reflectance of mirrors p0040 A82-10388
of selective surfaces for solar thermal p0044 A82-11425 rgy-applications program: ity requirements document p0014 N82-11616

p0066 N82-11209

p0055 A82-15439

Residual-energy-application program: BAST facility requirements document, volume 1 [DE81-027536] p0142 p0142 B82-13526 ZERR, S. W. Laser bonded n-Gals/p-GaSb heterojunction intercell Obsic contact p0041 A82-10776 ZEREL, J. B.
Metallurgical coatings 1980; Proceedings of the Seventh International Conference, San Diego, CA, April 21-25, 1980. Volumes 1 & 2 p0161 A82-17251 ZBWAIL, A. H. Luminescent solar concentrators. II - Experimental and theoretical analysis of their possible efficiencies p0052 A82-13285 ZERBB, A. Technological activities for high performance receivers [BMFT-FB-T-80-133] p0066 N82-10571 ZHANG, P. S. Thin-film gallium arsenide homojunction solar cells p0052 A82-13200 EIRLINSRI, R. E.
Pricetown 1 underground coal gasification field test: Operations report [DE81-025162] ZINOGOROVA, H. S. Gallium-arsenic-antimony heterojunction photocells p0055 A82-14667 ZONDERVAH, K. L.

The effect of non-Markovian cloud patterns on the design of a regulator for a solar-powered boiler
pn052 182-130 p0052 A82-13083 200K, J. D. Low cost silicon-on-ceramic photovoltaic solar cells p0059 A82-17098 20B. R. W. Highway fuel economy study [PB81-233850] p0026 N82-13986 ZURAWSKA, M. Temperature dependence of the short-circuit current in MIS solar cells p0052 A82-12825 ZUSCOVITCH, B. Economic effects induced by ESA contracts, phase 2. Volume 1: Summary [ESA-CR(P)-1462-VOL-1] p0161 N82-14981 ZWERDLING, S. High efficiency thin-film GaAs sclar cells p0046 A82-11767 ZWISSLER, J. G. Fracture mechanics of cellular glass [NASA-CR-164959]

ZYBERT, J. J.

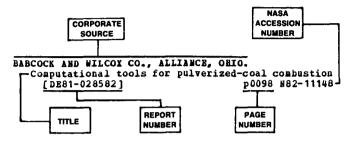
Colloidally deposited high-temperature solar selective surfaces

CORPORATE SOURCE INDEX

ENERGY / A Continuing Bibliography (Issue 33)

APRIL 1982

Typical Corporate Source Index Listing



The title of the document is used to provide a brief description of the subject matter. The page number and NASA or AIAA accession number are included in each entry to assist the user in locating the abstract. If applicable, a report number is also included as a aid in identifying the document

```
ACRES AMERICAN, INC., BUFFALO, N.Y.
Preliminary design study of underground pumped
hydro and compressed-air energy storage in
hard rock. Volume 1: Executive summary
                                                         p0155 N82-10527
        [DE81-0294401
     Preliminary design study of underground pumped
        hydro and compressed-air energy storage in
hard rock. Volume 2: Project design
        hard rock.
                        прн
        criteria:
        [DB81-028107]
                                                         p0156 N82-10528
     Preliminary design study of underground pumped
        hydro and compressed-air energy storage in
                          Volume 5: Site selection
        [DE81-028199]
                                                         p0156 N82-10529
    Preliminary design study of underground pumped
hydro and compressed-air energy storage in
                          Volume 8: Design approaches: UPH
        hard rock.
        [DE81-030673]
                                                         p0158 N82-11620
     Innovative equipment for small-scale hydro
        developments
                                                         p0141 N82-12634
        [ DE81-027820 ]
ACRES AMERICAN, INC., COLUMBIA, MD.
Preliminary design study of underground pumped
        hydro and compressed-air energy storage in
        hard rock. Volume 9: Design approaches, CAES. Appendix D: Mechanical systems
     [DE81-028200] policy N82-10530
Preliminary design study of underground pumped
        hydro and compressed-air energy storage in
        hard rock.
                          Volume 3: Project design
                        CAES
                                                          p0156 N82-10546
        [DE81-028197]
    Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] p0157 N82-10574
     Preliminary design study of underground pumped
        hydro and compressed-air energy storage in
hard rock. Volume 9: Design approaches:
CAES, appendix C. Major mechanical equipment
[DE81-030672] p0158 N82-11
                                                         p0158 N82-11621
ACUREY CORP., HOUSTAIN VIEW, CALIF.
Kinetics of NO/ sub x formation during early
        stages of pulverized-coal combustion [DB81-029071] p00
                                                          p0014 N82-11641
     Survey of particulate emission macro- and macro-sampling and sizing methods
        [DE81-028348]
                                                          p0014 N82-11642
```

```
Development of a high-temperature durable
       catalyst for use in catalytic combustors for
       advanced automotive gas turbine engines
                                                    p0142 N82-13510
       [NASA-CR-165396]
AEROCHEM RESEARCH LABS., INC., PRINCETON, N. J.
    Soot formation in synfuels
    [DE81-030273] p0099 N82-11164
Rate coefficients of combustion/fuel conversion
      reactions by high-temperature photochemistry
[DE81-027965] p0023 N82-1
                                                     p0023 N82-13192
AEROJET ENERGY CONSERVATION CO., SACRAMENTO, CALIF.
    Study of gelled LNG [DE81-023259]
                                                     D0095 N82-10269
    Fluid-bed heat-exchanger optimization and bed
       materials selection [DOE/ET-11343/T2]
ABRONAUTICAL RESEARCH INST. OF SWEDEN, STOCKHOLE.
    A two-dimensional study of the maximum power that can be obtained from a wind turbine in a
       wind shear layer
       [ PPA-134 ]
AEROSPACE CORP., EL SEGUNDO, CALIF.
    Project for reliability fleet testing of
       alcohol/gasoline blends
[DE82-000004]
                                                     p0107 N82-12250
    Solar Heating And Cooling Of Buildings (SHACOB):
Requirements definition and impact analysis-2.
       Volume 1: Energy-conserving design for
       residential structures
        DE82-900206]
    Solar Heating And Cooling Of Buildings (SHACOB):
Requirements definition and impact analysis-2.
                      Domestic hot water systems
       Volume 2:
       [DE82-900207]
                                                     p0071 N82-12279
    Solar Heating And Cooling Of Buildings (SHACOB):
Requirements definition and impact analysis-2.
       Volume 3: Customer load management systems
       [DE82-900208]
                                                     p0071 N82-12280
    Evaluation of techniques for reducing in-use automotive fuel consumption
[PB81-233298] p0026
AEROSPACE CORP., GERMANTOWN, HD.
Energy technologies and the environment.
                                                     n0026 N82-13985
       Environmental information handbook
                                                     p0020 N82-12660
       [DE81-029809]
    Technology characterizations: Environmental information handbook, second edition
                                                     p0021 N82-12671
       [DE81-029993]
ARROSPACE CORP., LOS ANGELES, CALIF.
Near-term goals for alcohol fuels from biomass:
       An overview of resource requirements, land use; environmental, and socioeconomic impacts [DE81-029987] p0010 N82-11245
    Assessment of flywheel system benefits in selected vehicle applications
       F DE81-025976 1
AGRI STILLS OF AMERICA, SPRINGPIELD, ILL.
    Development of a small-scale commercial alcohol
dehydration 190 to 200 proof
       [ DE81-030158 ]
                                                     p0100 N82-11235
AIR PORCE WRIGHT AERONAUTICAL LABS.,
WRIGHT-PATTERSON APB, OHIO.

Jet fuel locks to shale oil: The 1980
       technology review
       [AD-A104414]
                                                     p0100 N82-11228
AIR PRODUCTS AND CHEMICALS, INC., ALLENTOWN, PA.
Cryogenic methane separation/catalytic
hydrogasification process analysis
                                                     p0093 N82-10152
       [DE81-029123]
    Catalyst and reactor development for a
       liquid-phase fischer-tropsch process
                                                     p0099 #82-11168
       [DE81-028209]
```

```
AIR PRODUCTS AND CHEMICALS, INC., TREXLERTOWN, PA.
Load-change testing of a large commercial oxygen
        plant
[BPHI-NP-1824] p0096 N82-10275
AIRESEARCH MFG. CO., TORRANCE, CALIF.
Buffer thermal energy storage for a solar
Brayton engine
        [AIAA PAPER 81-2531]
                                                          p0053 A82-14002
     Brayton/Rankine 10-ton gas-fired space
        conditioning system, phase 2
                                                          p0139 N82-11478
        [PB81-223372]
ALUMINUM CO. OF AMERICA, PLITSBURGH, PA.
Pulverized-coal firing of aluminum melting
        furnaces
furnaces
[DOE/CS-40037/T2]

AMERICAN BAR ASSOCIATION, WASHINGTON, D.C.

Need for power and the choice of technologies:
State decisions on electric power facilities
p0027 882-14644
AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, NEW YORK.

Energy analysis sample building data
        [DB81-027188]
                                                          p0011 N82-11318
AMERIGAS, INC., VALLEY FORGE, PA.
Conceptual design for a multi-user medium BTU
        coal gasification complex. Volume 1:
        Executive summary
        [DE81-027139]
                                                          p0101 N82-11238
AMES LAB., IOWA.
     Ames Laboratory research report, 1980
                                                          p0161 N82-11012
     [DE81-027399]
Power-plant fly-ash utilization:
        chemical-processing perspective
        [DE81-025452]
                                                          p0022 N82-13191
     Transwall: A modular visually transmitting
        thermal storage wall
[DE81-029821] p0160 N82-15579
ANDCO ENVIRONMENTAL PROCESSES, INC., BUFFALO, N.Y.
Feasibility study for an alcohol-fuels plant for
       Buffalo, New 1
[DE82-000032]
                     New York
[DE82-000032] p0114 N82-14377
APPLIED DECISION ANALYSIS, INC., MENLO PARK, CALIF.
Evaluating R and D options under uncertainty.
Volume 2: Atmospheric fluidized-bed
        combustion commercialization strategies
        [DE81-904246]
                                                         p0035 N82-16012
    Evaluating R and D options under uncertainty.
        Volume 3: An electric-utility generation-expansion planning model
        DE81-904237]
                                                          p0035 N82-16013
APPLIED PHYSICS LAB., JOHNS HOPKINS UNIV., LAUREL,
    Energy programs at the johns hopkins university
Applied Physics Laboratory
        [PB81-218141]
                                                          p0013 N82-11535
     Alternate hybrid power sources for remote site
        applications
        [AD-A099471]
APTECH ENGINEERING SERVICES, INC., PALO ALTO, CALIF.
Investigation and research of specific
combustion-turbine and combined-cycle field
        problems
[DE81-904231] p0141 N82-12592
ARABIAN EXHIBITION MANAGEMENT LTD., MANAMA (BAHRAIN).
                                                          p0141 N82-12592
    SOLTECH 80
[DE81-901931]
                                                          p0079 N82-14643
ARGONEZ BATIONAL LAB., ILL.
Cyclone performance estimates for pressurized
        fluidized-bed combustion
       [DE81-028504]
                                                          p0093 N82-10156
    Enhancement of methane gas production using an
    industrial waste in anaerobic digestion
[DE81-023819] p0095 N82-
Practure flow of groundwater in coal-bearing
                                                          D0095 N82-10267
       strata
        [DE81-023810]
                                                         pC096 N82-10479
    Liquid-metal MHD for solar and coal
       [DE81-023545]
                                                         p0137 #82-10553
    Near-term batteries for electric vehicles
[DB81-023543] p0157 N82-10556
Recent progress in lithium/iron sulfide battery
        development
        [DE81-023127]
    Studies of the regeneration of activated bauxite used as granular sorbent for the control of
        alkali vapors from hot flue gas of coal
        combustion
        [DE81-030192]
                                                         p0008 N82-10590
```

```
Economic and environmental tradeoffs in coal
      conversion
      [CONF-800608-8]
                                                p0009 N82-10598
    Solar data base management system [DE81-023122]
                                                p0066 N82-10952
    Status of nickel/zinc and nickel/iron battery
      technology for electric vehicle applications [DE81-023572] p0157 N82-1
                                                p0157 N82-10962
    Vertical combustor for refuse combustion
                                                p0098 N82-11152
      [DE81-030002]
    Materials technology for coal-conversion processes [DE81-028474] p0100 N82-11169 Advanced system experimental facility: Solid
      waste to methane gas. Background and process
      description
      [ DE81-030198 ]
                                                p0101 N82-11244
    Site And Neighborhood Design (SAND):
      Development of simplified automated building
      thermal load procedures, phase 1 [DE81-027138]
                                                p0011 N82-11317
    Petroleum geology and resource assessment of the
      middle Caspian Basin, USSR, with special emphasis on the Uzen field
      [DE81-029951]
    Preliminary evaluation of advanced coal-based
      electricity-generating technologies by means of system-integration analysis
      [ DE81-029989 ]
                                                p0105 N82-11573
    Calcium/metal sulfide battery development program
      [ANL-81-14]
                                                p0158 N82-11578
    Recent advances in lead-acid cell research and
      development
      [ DE81-023104]
                                                p0158 N82-11580
    Solid and hazardous energy wastes:
                                                 Synfuels.
      1: Review of research activities [DE81-028503]
                                                p0014 N82-11644
    Density-measurement studies at the BI-GAS pilot
      plant
    [DE82-000910] { p0108 N82-122
The severity of institutional barriers affecting
                                               p0108 N82-12262
      energy-from-municipal-waste technologies
    [DE82-000133] p0018 N82-12583
Assessment of the potential of coal-fueled heat
engines in total and integrated energy systems
[DE82-000169] p0018 N82-12587
    Waste-to-energy Systems Institutional Barriers
      Assessment Workshop
      [DE82-000098]
                                                p0019 N82-12621
    Environmental data for sites in the National
      Solar Data Network [DE82-000071]
    Analysis of potential cogeneration impacts on
      electricity generation by the Central Maine
      Power Company
                                                p0028 N82-14650
      [DE81-029991] :
    Performance predictions of passive solar commercial buildings
      [ DE81-027979 ]
                                                p0079 N82-15247
ARINC RESEARCH CORP., ANNAPOLIS, MD.
    The use of flight management computers in air carrier operations in the 1980s
      [ AD-A105621 ]
                                                p0027 N82-14071
ARIZONA UNIV., TUCSON.
    Sulfur pollution control. Phase 1:
      disposal program
[PB81-222612]
                                                p0014 N82-11652
    Sulfur pollution control. Phase 1: The disposal program (sections 5 through 7)
    [PB81-222804] p0015 N82-11655
Fuel nitrogen conversion during fuel rich
      [ PB81-222804 ]
      combustion of pulverized coal and char
                                                p0105 N82-12156
    Guidebook for solar process-heat applications
      [ DE81-027977 ]
                                                p0072 N82-12598
ABKAMSAS UNIV., PAYETTEVILLE.
Mississippi County Community College solar
      photovoltaic project
                                                p0068 N82-11554
      FDE81-030669
ARMY AVIATION RESEARCH AND DEVELOPMENT COMMAND,
CLEVELAND, OHIO.

The effect of rotor blade thickness and surface
      finish on the performance of a small axial
      flow turbine
[NASA-TH-82726] p0141 N82-13114
ASTRO RESEARCH CORP., CARPIHTERIA, CALIF.
Eigh performance silicon solar arrays employing
     advanced structures
                                                p0045 A82-11758
```

Carcinogenic effects of coal-conversion materials

p0029 N82-14803

[DE81-028108]

CORPORATE SOURCE INDEX
ATLANTA UNIV., GA.
Cooperative program of applied energy research
technology development [DE81-028916] p0007 N82-10517
AUDI NSU AUTO UNION A.G., NECKARSULM (WEST GERMANY). Fuel savings in hot water heating plants by
application of heat pumps operated with
natural gas (natural gas heat pump). Project: gas engine
[BMFT-PB-T-80-125] p0020 N82-12641 AUTOMATION INDUSTRIES, INC., SILVER SPRING, ND.
Solar energy system performance evaluation: Porest City Dillon, Washington, D.C., January
1980 - December 1980
[DE81-028174] p0068 M82-11560 Solar energy system performance evaluation:
Solar energy system performance evaluation: Montecito Pines, Santa Rosa, California, November 1979 ~ April 1980
[DE81-028175] p0068 N82-11561
Environmental data for sites in the National Solar Data Network
[DE82-000071] p0075 N82-12707 AKIOMATIX, LOS ANGELES, CALIF.
An active alignment scheme for the MFTS array
p0147 N82-12541
В
BABCOCK AND WILCOX CO., ALLIANCE, OHIO.
Computational tools for pulverized-coal combustion [DE81-028582] p0098 N82-11148
BALES-HCCOIN TRACTIONNATIC, INC., BL FASO, TEX. Design study of a continuously variable roller
cone traction CVT for electric vehicles
[NASA-CR-159841] P0159 N82-12445 BARRY (THEODORE) AND ASSOCIATES, LOS ANGELES, CALIF.
Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background
[DE81-030982] p0069 N82-11566
Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic
systems design catalog [DE81-030986] p0069 N82-11567
Study of photovoltaic cost elements. Volume 4:
Installation cost model for residential PV systems: Users manual
[DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5:
Installation cost model for intermediate PV
[DE81-030981] p0069 N82-11569
BATTELLE COLUMBUS LABS., OHIO. Thermophysical properties of coal liquids
[DE81-0279446] p0097 N82-10938 Extensible bridge-conveyor concepts for
coal-mine face haulage
[DE81-031974] p0146 M82-12525 Energy recovery from municipal solid waste and
sewage sludge using multi-solid fluidized bed combustion technology
[DE82-001142] p0110 N82-12596
Use of coal cleaning for compliance with SO2 emission regulations
[PB81-247520] p0034 N82-15618 BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
Kinetics and catalysis of producing synthetic
gases from biomass [PB81-217614] pC095 N82-10272
Techniques for geothermal liquid sampling and analysis
[DE81-030151] p0098 N82-11149
Production and utilization of methane from anaerobic sludge digestion in U.S.
wastewater-treatment plants
[DE81-029958] p0101 N82-11246 Transportation fuels from synthetic gas

[DE81-029614] p0102 N8; Sampling design for the 1980 commercial and

Bibliography of the seasonal thermal energy

Biomass energy utilization in the Pacific Northwest: Impacts associated with residential use of solid fuels

Waste heat and chill storage in aquifer systems

storage library

[DE81-030470]

[DE81-029137]

[DE81-028016]

mpling design for the 1900 SCENERY Survey multifamily residential building survey p0011 N82-11320

p0102 N82-11258

p0159 N82-12586

p0115 N82-14383

p0159 N82-14652

```
Comparison of potential radiological
      consequences from a spent-fuel repository versus natural-uranium deposits
      [ DE81-028232 ]
                                               p0029 N82-14910
    Thermochemical production of liquids from blomass
      [DE81-030085]
                                               p0117 N82-15226
    Reservoir stability studies
                                              p0160 #82-15510
      [DE81-030099]
   Compressed-air energy-storage technology:
Program overview
                                               p0160 N82-15548
      [DE81-030103]
    Bcological effects assessment: Requirements vs
      state-of-the-art
[DE81-028092] p0032 N82-155:
BECHTEL CORP., SAN FRANCISCO, CALIF.
Alternative fuel for the steel industry of
Northern Indiana: A prefeasibility study of a
                                               p0032 N82-15598
      central coal gasification project
      [DE81-029314]
BECHTEL POWER CORP., SAN PRANCISCO, CALIP.
Environmental and economic comparison of
      advanced processes for conversion of coal and
      blomass into clean energy
      [ PB81-234239]
                                               p0023 N82-13256
BELL AEROSPACE CO., BUPPALO, N. Y.
   High-mass-flux coal gasifier
      [DE81-029807]
                                               p0094 N82-10257
BERGEN UNIV. (MORWAY).
Oll spill identification by chemical analysis
                                              p0115 N82-14583
BIOASSAY SYSTEMS CORP., WOBURN, MASS.
    Development of testing procedures and
      bibliographic information relevant to the testing of solid wastes resulting from
      synthetic fuels production
      [DE81-030822]
    Development of testing procedures and
      bibliographic information relevant to the
      testing of solid wastes resulting from
      synthetic-fuels production
      [DE81-030671]
                                               p0021 N82-12673
BIONETICS CORP., HAMPTON, VA.

Establishment of noise acceptance criteria for
      wind turbines
                                               p0125 A82-11825
BOEING AEROSPACE CO., SEATTLE, WASH.
SPS large array simulation
                                               p0071 N82-12540
    SPS phase control studies
                                               p0147 N82-12549
   SPS fiber optic link assessment
                                               p0147 N82-12550
    High efficiency SPS klystron design
                                               p0148 N82-12552
    SPS autenna element evaluation
                                               p0148 N82-12555
   Evaluation of thick wall wave guide element
                                              p0148 N82-12557
    Rectenna system design
                                               p0149 N82-12561
    Modified reference SPS with solid state
     transmitting antenna
                                               p0149 N82-12566
    SPS solid state antenna power combiner
                                              p0149 N82-12567
BOEING CO., SEATTLE, WASH.
   Solar project description for Public Service
Company of New Mexico (lot 7) single family
      residence, Rio Rancho, New Mexico
   [DE81-027853] p0063 N82-105
Solar project description for Colorado Sunworks:
Single family
                                              p0063 N82-10509
      [ DE81-028054]
                                              D0064 N82-10510
    Solar project description for living systems
     single family residence, Davis, California
      [ DE81-029743 ]
                                              p0064 N82-10511
BORING COMPUTER SERVICES, INC., SEATTLE, WASH.
Intermediate photovoltaic-system application
      experiment operational performance report.
     Volume 1: For Lowington Square Shopping
     Center site, Lovington, New Mexico [DE81-028971]
                                              p0065 N82-10543
   Intermediate photovoltaic system application experiment operational performance: Executive
      summary. Volum
El Paso, Texas
                  Volume 1: For Newman Power Station,
      [DE81-031934]
                                              p0072 N82-12602
```

Intermediate photovoltaic system a experiment operational performan	nplication
	ice report.
Volume 2 for Beverly High School	
[DE82-000811]	p0077 N82-13532
BORING ENGINEERING AND CONSTRUCTION,	
Peasibility and economic study of coal gas blended with high-Btu k	
as an industrial energy source a	
Montana	,.,.,
[DE81-030622]	p0107 N82-12254
BONE UNIV. (WEST GERMANY).	
Electrodes and diaphragms for fuel	
[BMPT-FB-T-81-047] BOOZ-ALLEN AND HAMILTON, INC., BETHES	p0143 N82-14666
User needs for solar decision-maki	ng tools: The
homebuilding industry	ing coord. The
[DE81-027293]	p0067 N82-11325
BOSTON COLL., WESTON, MASS.	
Exploration of coal and anthraciti	
shale resources, Warragansett Ba	isin,
Massachusetts, and Rhode Island [DB81-030895]	p0104 N82-11523
BRITISH GAS CORP., BENCASTLE-UPON-TYP	
Microprocessor applications for th	
and control of gas supplies	
[ERS-E-276]	p0097 N82-10735
BROBECK (WILLIAM M.) AND ASSOCIATES,	
Dynamic stability of stacked disk [DE81-030008]	p0156 N82-10535
BROOKHAVEN BATIONAL LAB., UPTON, N. 1	
Plame-retention head burner effici	
results and analysis: Space-hea	ting-equipment
test program	-0002 802 40452
[DE81-030219] Pusion as a source of synthetic fu	p0093 N82-10153
[BNL-29281]	p0086 N82-11257
Investigation of the zinc electron	le reaction
[DE81-030221]	p0157 N82-11368
DOE solar-assisted heat-pump progr	am: Its
evolution and its potential	-0067 300 44443
[DE81-026055]	p0067 N82-11413
Chemical heat pump program: An ov [DE81-025086]	p0012 N82-11414
Impurity effects in a-Si:H solar of	
[DE81-025069]	p0069 N82-11575
Solar heat pump simulator	
[DE81-024368]	p0070 N82-11583
Low-cost solar flat-plate-collecto	
	n0070 N82-11584
[DE81-025081] Modeling energy-conservation poten	p0070 N82-11584 tials of
Modeling energy-conservation poten	tials of
Modeling energy-conservation potent community energy-system technology [DE81-026059]	itials of ogies p0013 N82-11589
Modeling energy-conservation poten community energy-system technolo [DE81-026059] Development of catalytic systems if	utials of ogies p0013 N82-11589 for the
Modeling energy-conservation poten community energy-system technolo [DE81-026059] Development of catalytic systems f conversion of syngas to jet fuel	utials of ogies p0013 N82-11589 for the
Modeling energy-conservation potent community energy-system technology [DE81-026059] Development of catalytic systems for conversion of syngas to jet fuel fuel and higher alcohols	ntials of ogies p0013 N82-11589 for the and diesel
Modeling energy-conservation potent community energy-system technolog [DE81-026059] Development of catalytic systems for conversion of syngas to jet fuel fuel and higher alcohols [DE82-000067]	etials of ogies p0013 N82-11589 for the and diesel p0108 N82-12255
Modeling energy-conservation potent community energy-system technology [DE81-026059] Development of catalytic systems for conversion of syngas to jet fuel fuel and higher alcohols	utials of opies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected
Modeling energy-conservation potent community energy-system technology [DE81-026059] Development of catalytic systems of conversion of syngas to jet fuel fuel and higher alcohols [DE82-000067] Comparative economic performance of passive solar heating and cooling [DE81-030220]	ntials of ogies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected g technologies p0072 N82-12600
Modeling energy-conservation potent community energy-system technology (DB81-026059) Development of catalytic systems is conversion of syngas to jet fuelfuel and higher alcohols (DB82-000067) Comparative economic performance of passive solar heating and cooling (DB81-030220) Modelling energy-economic interact	tials of gies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected g technologies p6072 N82-12600 cions in
Modeling energy-conservation potent community energy-system technology (DB81-026059) Development of catalytic systems in conversion of syngas to jet fuel fuel and higher alcohols (DB82-000067) Comparative economic performance of passive solar heating and cooling (DB81-030220) Modelling energy-economic interact developing countries: A linear-	tials of gies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected g technologies p6072 N82-12600 cions in
Modeling energy-conservation potent community energy-system technology (DB81-026059) Development of catalytic systems is conversion of syngas to jet fuelfuel and higher alcohols (DB82-000067) Comparative economic performance of passive solar heating and cooling (DB81-030220) Modelling energy-economic interact	etials of ogies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected g technologies p0072 N82-12600 cions in programming
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems if conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an opti	policials of original property of the control of th
Modeling energy-conservation poter community energy-system technolog [DB81-026059] Development of catalytic systems is conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optiproblem	ntials of opies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected grechnologies p0072 N82-12600 cions in programming p0020 N82-12637 mal control
Modeling energy-conservation poter community energy-system technolog [DB81-026059] Development of catalytic systems for conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optiproblem [DB81-028465]	ntials of origins pool of the and diesel pollow N82-12255 of selected green technologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842
Modeling energy-conservation potent community energy-system technology [DB81-026059] Development of catalytic systems in conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optimation of the problem [DB81-028465] Cryogenic testing of 100-m supercommunity community supercommunity.	ntials of origins pool of the and diesel pollow N82-12255 of selected green technologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842
Modeling energy-conservation poter community energy-system technolog [DB81-026059] Development of catalytic systems if conversion of syngas to jet fuel fuel and higher alcohols [DE82-000067] Comparative economic performance of passive solar heating and cooling [DE81-030220] Modelling energy-economic interact developing countries: A linear-approach [DE81-026048] Project impact analysis as an optimation of the problem [DE81-028465] Cryogenic testing of 100-m supercontransmission test facility	tials of opies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected g technologies p0072 N82-12600 fons in programming p0020 N82-12637 mal control p0021 N82-12842 onducting power
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems if conversion of syngas to jet fuel fuel and higher alcohols [DE82-000067] Comparative economic performance of passive solar heating and cooling [DE81-030220] Modelling energy-economic interact developing countries: A linear-approach [DE81-026048] Project impact analysis as an optime problem [DE81-028465] Cryogenic testing of 100-m supercommunity of the superc	ntials of opies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected g technologies p0072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 onducting power p0150 N82-13517
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems if conversion of syngas to jet fuel fuel and higher alcohols [DE82-000067] Comparative economic performance of passive solar heating and cooling [DE81-030220] Modelling energy-economic interact developing countries: A linear-approach [DE81-026048] Project impact analysis as an optimation problem [DE81-028465] Cryogenic testing of 100-m supercontransmission test facility [DE81-028331] Coal-oil mixtures: An alternative commercial markets and large reservances.	tials of ggies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected gg technologies p0072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 inducting power p0150 N82-13517 e fuel for the sidential markets
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems in conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optimation problem [DB81-028465] Cryogenic testing of 100-m supercontents of the content of the commercial markets and large resumercial markets a	etials of opies p0013 N82-11589 for the and diesel p0108 N82-1255 of selected g technologies pC072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 orducting power p0150 N82-13517 effuel for the sidential markets p0114 N82-14379
Modeling energy-conservation poter community energy-system technolog [DB81-026059] Development of catalytic systems is conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optiproblem [DB81-028465] Cryogenic testing of 100-m supercontransmission test facility [DB81-028331] Coal-oil mixtures: An alternative commercial markets and large res [DB81-028335] Potential supply of synthetic fuel	etials of opies p0013 N82-11589 for the and diesel p0108 N82-1255 of selected g technologies pC072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 orducting power p0150 N82-13517 effuel for the sidential markets p0114 N82-14379
Modeling energy-conservation potent community energy-system technology [DB81-026059] Development of catalytic systems in conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optimate problem [DB81-028465] Cryogenic testing of 100-m supercontransmission test facility [DB81-028331] Coal-oil mixtures: An alternative commercial markets and large results [DB81-028335] Potential surply of synthetic fuel hydroelectric power and coal	polis N82-1255 of selected go technologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 onducting power p0150 N82-13517 e fuel for the sidential markets p0114 N82-14379 es from Alaskan
Modeling energy-conservation poter community energy-system technolog [DB81-026059] Development of catalytic systems if conversion of syngas to jet fuel fuel and higher alcohols [DE82-000067] Comparative economic performance of passive solar heating and cooling [DE81-030220] Modelling energy-economic interact developing countries: A linear-approach [DE81-026048] Project impact analysis as an optimation problem [DE81-028465] Cryogenic testing of 100-m supercontransmission test facility [DE81-028331] Coal-oil mixtures: An alternative commercial markets and large results [DE81-028335] Potential supply of synthetic fuel hydroelectric power and coal [DE81-025743]	etials of opies pools N82-11589 for the and diesel pollow N82-1255 of selected getechnologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 orducting power p0150 N82-13517 effect for the sidential markets p0114 N82-14381
Modeling energy-conservation poter community energy-system technolog [DB81-026059] Development of catalytic systems in conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optimation of the problem [DB81-028465] Cryogenic testing of 100-m supercontransmission test facility [DB81-028331] Coal-oil mixtures: An alternative commercial markets and large resummercial markets and large resummercial supply of synthetic fuel hydroelectric power and coal [DB81-025743] Development of a metal hydride property in the synthetic of the synthetic fuel hydroelectric power and coal [DB81-025743]	tials of opies pools as a pools and diesel pollo 8 N82-1255 of selected getechnologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 onducting power p0150 N82-13517 efuel for the sidential markets p0114 N82-14379 cs from Alaskan p0114 N82-14381 occess for cited natural gas
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems if conversion of syngas to jet fuel fuel and higher alcohols [DE82-000067] Comparative economic performance of passive solar heating and cooling [DE81-030220] Modelling energy-economic interact developing countries: A linear-approach [DE81-026048] Project impact analysis as an optimation problem [DE81-028465] Cryogenic testing of 100-m supercontransmission test facility [DE81-028331] Coal-oil mixtures: An alternative commercial markets and large resumercial surply of synthetic fuel hydroelectric power and coal [DE81-025743] Development of a metal hydride prohydrogen recovery from supplement [DE81-022685]	rtials of opies pools N82-11589 for the and diesel pollow N82-12255 of selected grechnologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 onducting power p0150 N82-13517 or fuel for the sidential markets p0114 N82-14379 cs from Alaskan p0114 N82-14381 occess for teed natural gas p0086 N82-14382
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems if conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optimate problem [DB81-028465] Cryogenic testing of 100-m supercontensmission test facility [DB81-028331] Coal-oil mixtures: An alternative commercial markets and large resumercial supply of synthetic fuel hydroelectric power and coal [DB81-025743] Development of a metal hydride prohydrogen recovery from supplement [DB81-02685] Systems analysis of hydrogen/naturestations are supplement of the sydrogen/natures.	rtials of opies pools N82-11589 for the and diesel pollow N82-12255 of selected grechnologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 onducting power p0150 N82-13517 or fuel for the sidential markets p0114 N82-14379 cs from Alaskan p0114 N82-14381 occess for teed natural gas p0086 N82-14382
Modeling energy-conservation poter community energy-system technolog [DB81-026059] Development of catalytic systems in conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optimation of the problem [DB81-028465] Cryogenic testing of 100-m supercontransmission test facility [DB81-028331] Coal-oil mixtures: An alternative commercial markets and large resumercial markets and large resumercial supply of synthetic fuel hydroelectric power and coal [DB81-025743] Development of a metal hydride prohydrogen recovery from supplement [DB81-022685] Systems analysis of hydrogen/natur supplementation and separation	etials of opies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected getechnologies p0072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 orducting power p0150 N82-13517 effuel for the sidential markets p0114 N82-14379 as from Alaskan p0114 N82-14381 ocess for ited natural gas p0086 N82-14382 cal gas
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems in conversion of syngas to jet fuel fuel and higher alcohols [DE82-000067] Comparative economic performance of passive solar heating and cooling [DE81-030220] Modelling energy-economic interact developing countries: A linear-approach [DE81-026048] Project impact analysis as an optimation problem [DE81-028465] Cryogenic testing of 100-m supercontransmission test facility [DE81-028331] Coal-oil mixtures: An alternative commercial markets and large resumercial surply of synthetic fuel hydroelectric power and coal [DE81-025743] Development of a metal hydride prohydrogen recovery from supplement [DE81-022685] Systems analysis of hydrogen/natur supplementation and separation [DE81-021383]	rtials of opies pools N82-11589 for the and diesel pollow N82-12255 of selected grechnologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 onducting power p0150 N82-13517 erfuel for the sidential markets p0114 N82-14379 cs from Alaskan p0114 N82-14381 occess for ted natural gas p0086 N82-14382 and gas p0087 N82-15220
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems if conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optimation problem [DB81-028465] Cryogenic testing of 100-m supercontransmission test facility [DB81-028331] Coal-oil mixtures: An alternative commercial markets and large resumercial supply of synthetic fuel hydroelectric power and coal [DB81-025743] Development of a metal hydride prohydrogen recovery from supplement [DB81-022685] Systems analysis of hydrogen/natur supplementation and separation [DB81-021383] Improved technique to measure electric power and coal [DB81-021383]	rtials of opies p0013 N82-11589 for the and diesel p0108 N82-12255 of selected g technologies p0072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 anducting power p0150 N82-13517 e fuel for the cidential markets p0114 N82-14379 s from Alaskan p0114 N82-14381 coess for actural gas p0086 N82-14382 cal gas p0087 N82-15220 ctronically AC
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems in conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optimate problem [DB81-028465] Cryogenic testing of 100-m supercontransmission test facility [DB81-028331] Coal-oil mixtures: An alternative commercial markets and large resummercial surply of synthetic fuel hydroelectric power and coal [DB81-028374] Development of a metal hydride prohydrogen recovery from supplement [DB81-022685] Systems analysis of hydrogen/natur supplementation and separation [DB81-021383] Improved technique to measure electors of the second coal [DB81-021383] Improved technique to measure electors of the second coal [DB81-021383]	rtials of opies pools N82-11589 for the and diesel pollow N82-12255 of selected getechnologies pc072 N82-12600 cions in programming pollow N82-12637 mal control pollow N82-12842 onducting power pollow N82-13517 efuel for the sidential markets pollow N82-13317 es from Alaskan pollow N82-14381 ocess for cited natural gas pollow N82-14382 cal gas pollow N82-15220 ctronically AC is pollow N82-15338
Modeling energy-conservation poter community energy-system technolo [DB81-026059] Development of catalytic systems if conversion of syngas to jet fuel fuel and higher alcohols [DE82-000067] Comparative economic performance of passive solar heating and cooling [DE81-030220] Modelling energy-economic interact developing countries: A linear-approach [DE81-026048] Project impact analysis as an optimation problem [DE81-028465] Cryogenic testing of 100-m supercontransmission test facility [DE81-028331] Coal-oil mixtures: An alternative commercial markets and large results [DE81-028335] Potential surply of synthetic fuel hydroelectric power and coal [DE81-025743] Development of a metal hydride prohydrogen recovery from supplement [DE81-022685] Systems analysis of hydrogen/natur supplementation and separation [DE81-021383] Improved technique to measure electorses in superconducting cables [DE81-029323] Bole of large scale energy systems	rtials of opies pools N82-11589 for the and diesel pollow N82-12255 of selected getechnologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 onducting power p0150 N82-13517 efuel for the sidential markets p0114 N82-14379 cs from Alaskan p0114 N82-14381 ocess for cited natural gas p0086 N82-14382 cal gas p0087 N82-15220 ctronically AC in p0150 N82-15338
Modeling energy-conservation potent community energy-system technolog [DB81-026059] Development of catalytic systems in conversion of syngas to jet fuel fuel and higher alcohols [DB82-000067] Comparative economic performance of passive solar heating and cooling [DB81-030220] Modelling energy-economic interact developing countries: A linear-approach [DB81-026048] Project impact analysis as an optimate problem [DB81-028465] Cryogenic testing of 100-m supercontransmission test facility [DB81-028331] Coal-oil mixtures: An alternative commercial markets and large resummercial surply of synthetic fuel hydroelectric power and coal [DB81-028374] Development of a metal hydride prohydrogen recovery from supplement [DB81-022685] Systems analysis of hydrogen/natur supplementation and separation [DB81-021383] Improved technique to measure electors of the second coal [DB81-021383] Improved technique to measure electors of the second coal [DB81-021383]	rtials of opies pools N82-11589 for the and diesel pollow N82-12255 of selected getechnologies pc072 N82-12600 cions in programming p0020 N82-12637 mal control p0021 N82-12842 onducting power p0150 N82-13517 efuel for the sidential markets p0114 N82-14379 cs from Alaskan p0114 N82-14381 ocess for cited natural gas p0086 N82-14382 cal gas p0087 N82-15220 ctronically AC in p0150 N82-15338

```
Comparative thermal performance of direct gain,
      Trombe, and sunspace walls
      [DE81-030546]
                                              p0081 N82-15571
    Real-time coarse-particle mass measurements in a
      high-temperature/pressure coal-gasifier
      process treatment
                                               p0119 N82-15604
      f DE81-030039 1
   Real time coarse particle mass measurements in a
high temperature and pressure coal gasifier
      process treatment
      [DL81-030036]
                                              p0033 N82-15609
    Application of an LP model to strategic planning
      of multinational cooperative RD and D programs
[DE81-029325] p0035 N82-16014
BROWN UNIV., PROVIDENCE, R. I. Plow in geothermal wells.
                                    Part 4: Transition
      criteria for two-phase flow patterns
                                              p0096 N82-10366
      [DE81-028312]
    Analysis of thermal/mechanical energy-conversion
      concepts
[DE81-027854] p0139 N82-115
BUNDESANSTALT FUER GEOWISSENSCHAFTEN UND ROHSTOFFE,
                                               DO139 N82-11585
HANNOVER (WEST GERMANY) .
    Development of organic geochemical and isotope
      techniques for hydrocarbon exploration [BMFT-FB-T-80-076] p0097
                                              p0097 N82-10482
BUREAU OF MINES, PITTSBURGH, PA.

Creating a safer environment in US coal mines:
      The Bureau of Mines Methane Control Program,
      [ PB81-233918]
                                               p0112 N82-13488
    Suppression of coal dust explosion by water
      barrier in a conveyor belt entry
      [PB81-233306]
                                              p0024 N82-13489
BURRAU OF THE CENSUS, WASHINGTON, D. C. Fuels and electric energy consumed
                                              p0032 N82-15594
      [PB81-240442]
BURNS AND ROE, INC., WOODBURY, N. Y.
MHD oxidant intermediate temperature ceramic
      heater study
      [NASA-CR-165453]
                                               p0144 N82-15527
BURNS AND ROE INDUSTRIAL SERVICES CORP., PARAMUS,
N. J.
   Low/medium Btu coal gasification assessment program for potential users in New Jersey:
      Executive summary
      [DE81-025475]
                                               p0111 N82-13247
CALIFORNIA DEPT. OF CONSERVATION, SACRAMENTO.
    Geophysical survey, Paso Robles geothermal area,
California, part of the resource assessment of
      low- and moderate-temperature geothermal
      resource areas in California
      [DE81-026038]
                                               p0109 N82-12517
    Resource assessment of Low and
      Moderate-temperature geothermal waters in
Calistoga, Napa County, California
[DE81-025559] p0109 N82-12518

CALIFORNIA UNIV., BERKELEY. LAWRENCE BERKELEY LAB.
Chemistry and morphology of coal liquefaction
      [DE81-028899]
                                              p0095 N82-10264
    Novel design of pressure vessels and thermal
      shields in coal gasifiers
      [DE81-025828]
                                              p0104 N82-11474
    Calcium/metal sulfide battery development program
     [ANL-81-14]
                                              p0158 N82-11578
   Controls for solar heating and cooling [DE81-025209] p00
                                              p0070 N82-11593
    Overview of the applied battery and
      electrochemical research program
      [DE81-027397]
                                              p0158 N82-11594
    Rechargeable molten-salt cells
      [DE81-027091]
    Intergrated assessment for energy-related
      environmental standards: A summary of issues
      and findings
```

Urban ecosystem and resource-conserving urbanism

Oxydesulfurization of coal by acidic iron

Study of ATES thermal behavior using a steady

p0014 N82-11646

p0016 N82-11995

p0106 N82-12199

p0159 N82-12396

[DE81-0285521

flow model [DE81-030883]

in Third World cities [DE81-029854]

sulfate solutions [DE82-000464]

```
Analysis of the energy impacts of the DOE
      Appropriate Energy Technology Small Grants Program: Method and results
      [DB81-029844]
                                              p0028 N82-14651
   Potential energy savings in the residential
      sector of the United States [DE81-028873]
                                               p0028 N82-14662
   Theoretical basis of the DOE-2 building energy
      use analysis program
[DE81-028896]
                                              p0030 N82-15242
   Incremental cocling load determination for
      passive direct gain heating systems
                                              p0081 N82-15575
      [DE81-029862]
   Overview of active solar absorption/Bankine
      cooling program
      [DE81-028041]
                                              p0C82 N82-15577
   Verification of BLAST by comparison with
      measurements of a solar-dominated test cell
      and a thermally massive building [DE81-029883]
                                              p0082 N82-15578
   Kinetics of reactions in a wet flue gas
      simultaneous desulfurization and
      denitrification system
      [DE81-029853]
                                               p0033 N82-15607
   Indoor air quality
[DE81-029857]
                                              p0033 N82-15611
   GRAD: A tool for program analysis and progress
      monitoring
      [DE81-028098]
                                               p0120 N82-15981
CALIFORNIA UNIV., DAVIS.
   Chronic exposure of a honey bee colony to 2.45 GHz continuous wave microwaves
                                              p0003 A82-14347
CALIFORNIA UNIV., LIVERMORB. LAWRENCE LIVERMORE LAB.
   Mechanical energy storage technology project [DE81-029753] p0155 N82
   [DE81-029753] p0155 N82-10508
Dynamic stability of stacked disk type flywheels
      [DE81-030008]
                                              p0156 N82-10535
   Solar coal-gasification reactor for
      hydrocarbon-free synthesis gas
                                              p0067 N82-11247
      [DE81-026600]
   Controlled Retracting Injection Point (CRIP)
system: A modified-stream method for in situ
      coal gasification
      [DE81-026477]
   Possible use of coal in Hawaii, 1980 - 2000 [DE81-028266] p0010 N8
                                              p0010 N82-11263
   LINL underground coal gasification project p0103 N82-11267
   Mechanical Energy Storage Technology (MEST)
      development
      [DE81-026800]
                                              p0158 N82-11596
   Computer models to support investigations of surface subsidence and associated ground motion induced by underground coal gasification
      [DB81-027131]
                                              p0015 N82-11712
   Designing process wells for an underground
      coal-gasification environment
      [DE81-028434]
                                              p0108 N82-12264
   Soviet UCG experience specifically related to field experiments in the United States
      [DE81-028642]
                                              p0111 N82-13244
   Ultimate in building energy analysis: DOE-2 and
      BLAST
   [DE81-028703] p0023 N82-13263
Design and test of two-ster solar oil shale retort
                                              p0023 N82-13263
      [DE82-000964]
                                              p0077 N82-13543
   LLNL 1981: Technical horizons
[DE81-028265] p0026 M8:
Mathematical modelling of some chemical and
                                              p0026 N82-14048
      physical processes in underground coal
      gasification
      [DE81-027941]
                                              p0116 N82-14613
   Fire-protection research for energy technology:
     Py 80 year end report [DB82-000970]
                                              p0161 N82-14649
   Flywheel rotor and containment technology
      development
      [DE81-028047]
   Puture of electricity for automobiles: Advanced
      electric vehicle concepts
      [DE81-028235]
   [DB81-028235] p0029 N82-14987
High-pressure solvent extraction of methane from
      geopressured fluids
   [DE81-027713] p0117 N82-15227 Three-dimensional, finite elemental model for
     simulating heavier-than-air gaseous releases over variable terrain
      [DE81-028689]
                                              p0032 N82-15602
```

```
Elemental composition of atmospheric fine-particles emitted from coal burned in a modern electric power plant equipped with a
       flue-gas desulfurization system
    [DE81-030073] p0033 N82-15610
Methodology and basic algorithms of the
Livermore Economic Modeling Systems
       [DE81-029430]
                                                     p0035 N82-15833
CALIFORNIA UNIV., LOS ANGELES.
    A computer simulation modeling study to predict air quality impacts from a 500 MW coal-fired
       power plant
                                                      p0020 N82-12650
    Asymmetric stress and failure analysis
[ DE81-026842 ] P0142 N82-13451
CASE WESTERN RESERVE UNIV., CLEVELAND, OHIO.
    Multijunction high voltage concentrator solar
       cells
                                                     p0047 A82-11796
Transient catalytic combustor model
[NASA-CR-165324] p0142 N82-1
CENTURY ENGINEERING, INC., TOWSON, MD.
Evaluation of landfill gas as an energy source
                                                     p0142 N82-13507
       [DE82-000116]
                                                     p0110 N82-12584
CHEMICAL OIL RECOVERY CO., BAKERSFIELD, CALIF.
Field demonstration of the conventional steam
       drive process with ancillary materials [DE81-026962] p0115
                                                     p0115 N82-14523
CHEMISCHE WERKE, HUBLS (WEST GERMANY).

Assessment of potential future markets for the production of hydrogen from water
[BMFT-FB-T-81-012] p0086 N82-1
                                                     p0086 N82-12266
CHERRYWOOD FARMS, WILLIAMSBURG, MICH.
    Project demonstration of wind-turbine
       electricity: Interconnecting a northern Bichigan fruit farm with a major utility
       [DE81-030950]
                                                     p0138 N82-11380
CHICAGO UNIV., ILL.
Nonimaging concentrators for photovoltaic arrays
       in space
                                                     p0046 A82-11761
    Integrated function nonimaging concentrating
       collector tubes for solar thermal energy
       [DE81-029677]
                                                     p0064 N82-10521
CHRYSLER CORP., DETROIT, MICH.
    AGT-102 automotive gas turbine
                                                     D0140 N82-12444
[NASA-CK-10353,
CINCINNATI UNIV., OHIO.
Coal hydrogenation via bonding of metallic
coalman to coal, part 1. Solubilization of
       [ NASA-CR-165353 ]
       compounds to coal, part 1. Solubilizat. Illinois bituminous coal - the critical
       importance of methylene group cleavage, part 2 [DE81-027562] p0100 N82-11236
       [DE81-027562]
CITY UNIV. OF NEW YORK, N. Y.
Thermoelectric conversions based on noise
       rectification
                                                     p0138 N82-10936
COECORP, MOUNTAIN VIEW, CALIF.
Workshop proceedings: Combustion Turbine
Residual Oil
       [EPRI-WS-80-132]
    Investigation and research of specific
       combustion-turbine and combined-cycle field
       problems
       [ DE81-904231]
                                                     p0141 N82-12592
COLORADO SCHOOL OF MINES, GOLDEN.
    Enthalpy measurement of coal-derived liquids
       [DE81-029481]
                                                     p0097 N82-10939
COLORADO STATE UNIV., PORT COLLINS.
    Effects of atmospheric variability on energy
       utilization and conservation
       [DE81-026308]
                                                     p0008 N82-10592
                           Report for May, June, July p0079 N82-14665
    REPEAT facility.
       [DE81-028156]
COLORADO UNIV. AT BOULDER.
Geology of the nahcolite deposits and associated
       oil shales of the Green River Pormation in the
       Piceance Creek Basin, Colorado
                                                     p0105 N82-11683
COMBUSTION ENGINEERING, INC., WINDSOR, CONN.
    Low-Btu gasification of coal for electric power
       generation, phase 1, 2, and 3 [DE81-029482]
COMMISSION OF THE EUROPEAN COMMUNITIES, LUXEMBOURG.
Application of different KFA-models in the
       framework of the energy research programme of the European Communities
```

[EUR-6758-EN]

p0019 N82-12597

```
COMMUNICATIONS SATELLITE CORP., CLARKSBURG, MD.
     High- and low-resistivity silicon solar cells
                                                          p0646 A82-11762
COMPTROLLER GENERAL OF THE UNITED STATES.
WASHINGTON, D.C.
Natural gas plan needed to provide greater
        protection for high-priority and critical uses
                                                          p0023 N82-13255
        [ PB81-228488 ]
     Millions wasted trying to develop major energy
        information system
                                                          pC029 N82-14959
        [APMD-81-40]
COMMECTICUT DEPT. OF TRANSPORTATION, WETHERSFIELD.
Construction of a recycled Portland cement
        concrete pavement
[PB81-233553]
                                                          p0023 N82-13267
CONOCO BORBAY, INC., OSLO.
     Offshore petroleum industry environmental data
        requirements: Eaphasis on remote sensing
                                                          p0027 N82-14557
COORDINATING RESEARCH COUNCIL, INC., ATLANTA, GA.
Informational report on the measurement and
characterization of diesel exhaust emissions
        [PB81-221251]
                                                          p0009 N82-11175
COORS PORCELAIN CO., GOLDEN, COLO.
Low cost silicon-on-ceramic photovoltaic solar
        cells
                                                          p0059 A82-17098
CORNELL UNIV., ITHACA, B. Y.
Ethanol production in southern tier east region
        of New York: Technical and economic feasibility
        [PB81-226979]
                                                          p0011 N82-11275
     Pyrolysis of coal-drived fuels using the
        laser-powered homogeneous pyrolysis technique [DE82-000251] p0106 N82-12
ORPORATE-TECH FLANHING, INC., WALTHAM, MASS.

Augmentation of research and analysis
capabilities for timely support of automotive
fuel economy activities. Volume 1: Summary
[PB81-219479]
Augmentation of research and analysis
                                                          p0106 N82-12196
                                                         p0022 N82-13018
    puvzz N82-131
Augmentation of research and analysis
capabilities for timely support of automotive
fuel economy activities. Volume 2:
Appendices A through C
[PB81-219487]
Augmentation of research and analysis
        capabilities for timely support of automotive
                                              Volume 3: Appendix D p0022 N82-13020
        fuel economy activities.
        [ PB81-219495 ]
COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH.
PRETORIA (SOUTH AFRICA).
Selectivity in Fischer-Tropsch synthesis:
Review and recommendations for further work
[PB81-223596] p0095 N82-10271
COURY AND ASSOCIATES, INC., LAKEWOOD, CCLO.
Two-phase flow in geothermal energy sources
[DE81-029037] p0103 N82-11404
DARTHOUTE COLL., HANOVER, N.H.
Partial acid hydrolysis pretreatment for
enzymatic hydrolysis of cellulose: A process
development study of ethanol production
                                                         p0107 N82-12236
DATA RESOURCES, INC., LEXIEGTON, MASS.
Models for forecasting energy use in the US farm
        sector
        [DE81-904220]
                                                          p0018 N82-12580
     Regional load-curve models: Scenario and
        forecast using the DRI model
                                                          p0033 N82-15605
        [DE81-904192]
DCS CORP., WASHINGTON, D.C.
Assessment of building diagnostics
       [DB81-027078]
                                                          p0012 N82-11321
DELAWARE UNIV., NEWARK-
Zn3P2 as an improved semiconductor for
        photovoltaic solar cells
        [DB81-025587]
                                                          p0069 N82-11577
     Development of superior denitrogenation and
        isomerization catalysts for processing crude
        oil derived from shale, part 1
        [AD-A105667]
                                                          p0113 N82-14317
DENVER RESEARCH INST., COLO.

Two-phase flow in geothermal energy sources
[DE81-029037] p0103 N83
DEPARTMENT OF AGRICULTURE, WASHINGTON, D.C.
The young solar collectors
     The young solar collector: An evaluation of its multiple farm uses
```

PC066 N82-10577

```
Energy expenditure and dietary change
       [PB81-218471]
                                                     p0009 N82-10717
    Solar-supplemented, natural air drying of shelled corn: The economic limitations
       [ PB81-235681]
                                                     D0079 N82-14668
DEPARTMENT OF ENERGY, BARTLESVILLE, OKLA.
Liquid fossil fuel technology
       [DE81-029912]
                                                     p0094 N82-10250
    Performance characteristics of automotive
       engines in the United States, third series: 1977 Chrysler 318 CID (5.21), 2V
       [ PB81-233025]
                                                     p0023 N82-13435
    Motor gasolines, winter 1980-81
       [DE81-030845]
    Automotive fuel economy: Potential improvement
       through selected engine and differential gear
       lubricants
       [ PB81-240467 1
                                                     p0030 N82-15453
DEPARTMENT OF EMERGY, LARAMIE, WYO.
Sixth Underground Coal-Conversion Symposium
       [DE81-027669]
                                                     p0114 N82-14374
    Bibliography of publications dealing with tar
       sands
[DE81-026146] p0115 N82-
DEPARTMENT OF ENERGY, MORGANTOWN, W. VA.
Atmospheric fluidized-bed projects technology
                                                     p0115 N82-14594
       overview
       [DE81-027143]
                                                     p0102 N82-11251
    [DE81-030183]
Advanced-gasification processes
[DE81-030184]
                                                     D0102 N82-11253
                                                     p0102 N82-11254
    Fixed-bed gasification [DE82-000432]
                                                     p0108 N82-12261
DEPARTMENT OF ENERGY, OAK RIDGE, TENN.
Solvent-Refined Coar-1 Demonstration Project.
Pinal environmental impact statement, Volume 1
       of 2
       [DE81-025983]
    Information resources in the USA on new and
       renewable energy, a description and directory
                                                    p0024 N82-13522
       [DE81-028867]
DEPARTMENT OF ENERGY, PITTSBURGE, PA.
Longwall mining of thin seams
[DE81-028042]
                                                     p0116 N82-14612
DEPARTMENT OF ENERGY, WASHINGTON, D. C.
Venezuela, Trinidad and Tobago: Crude oil
potential from known deposits
    [DE81-027023] p0096
Electric power supply and demand for the
                                                     p0096 N82-10474
       contiguous United States, 1981 - 1990
       [DE81-027126]
                                                     p0012 N82-11376
    Interrelationships of energy and the economy: A supplement to the National Energy Policy Plan required by Title VIII of the US Department of
       Energy Organization Act (Public Law 95-91)
                                                     p0013 N82-11613
       [DE81-027526]
    Analysis report: Applied analysis model summaries [DE81-029278] p0018 N82-12526
       [DE81-029278]
    Department of Energy projects
       [DE82-000038]
                                                     p0018 N82-12579
    National interim energy-consumption survey:
       Exploring the variability in energy consumption
       [DE81-029910]
                                                     p0018 N82-12589
    International energy indicators
[DE81-028117] p0028 N82-14653
Annual report to the President and the Congress
       on the State Energy Conservation Program for
       calendar year 1980
[DE81-025862]
                                                     p0031 N82-15554
    Annual DOB Active Solar Heating and Cooling
       Contractors Review meeting [DE81-028052]
                                                     p0081 N82-15572
    Technology of controlled nuclear fusion
       [DE81-027361]
                                                     p0144 N82-15893
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT,
WASHINGTON, D. C.
    Solar project description for living systems single family residence, Davis, California
       [ DE81-029743 ]
                                                    p0064 882-10511
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT PUER LUPT-
UND RAUMFAHET, GOETTINGEN (WEST GERMAN).

Calculation of natural modes of vibration for rotor blades by the finite element method [DPVLR-FB-81-07] p0136 882-
                                                     p0136 N82-10452
```

[PB81-214132]

```
DEUTSCHE PORSCHUNGS- UND VERSUCHSANSTALT PURR LUFT-
UND RAUMFAHRT, STUTTGART (WEST GERMANY).
Hydrogen as carrier of secondary energy:
Proposal for a research and development program
[DFVLR-MITT-81-10] p0087 N82-1554:
                                                                                                                  ENGINEERING SOCIETIES COMMISSION ON ENERGY, INC.,
                                                                                                                        Barriers to the utilization of synthetic fuels
                                                                                                                           for transportation
                                                                                                                            [ NASA-CR-165517 ]
                                                                       p0087 N82-15542
                                                                                                                                                                                          p0023 N82-13243
DER, INC., WASHINGTON, D.C.
                                                                                                                  BEVIRONMENTAL PROTECTION AGENCY, ANN ARBOR, MICH.
      Market assessment of photovoltaic power systems
                                                                                                                        An evaluation of three-way control single and
         for agricultural applications in Mexico
                                                                                                                            dual bed catalysts as applied to heavy-duty
                                                                                                                           gasoline engines
[PB81-224982]
         [ NASA-CR-165441]
                                                                       p0007 N82-10506
      Market assessment of photovoltaic power systems for agricultural applications in Morocco
                                                                                                                        [PB81-224982] p0012 M82-11477
EPA evaluation of the PUEL-MAX device under
Section 511 of the Motor Vehicle Information
          [ NASA-CR-165477]
                                                                        pCC77 N82-14627
DORNIER-WERKE G.M.B.H., PRIECEICHSHAPEN (WEST
                                                                                                                            and Cost Savings Act
                                                                                                                            [ PB81-229866 ]
GERMANY) .
                                                                                                                        EPA evaluation of the Automotive Cylinder
Deactivator System (ACDS) under Section 511 of
the Motor Vehicle Information and Cost Saving
      Development of a prototype of a 10 kW small
         solar power plant [BMPT-PB-T-81-101]
                                                                        p0080 N82-15532
      High efficient collector for small sclar-powered
                                                                                                                            Act
                                                                                                                                                                                          p0013 N82-11480
         facilities
                                                                                                                           [ PB81-228256 ]
                                                                                                                        Heavy-duty engine baseline program and NO sub x emission standard development (1972-73)
         [BMFT-FB-T-81-156]
                                                                        DC080 N82-15538
DYNATICE CORP., CAMBRIDGE, MASS.
Biomethanation of biomass pyrolysis gases
                                                                                                                  [PB81-244030] p0034 N82-15621

ENVIRONMENTAL PROTECTION AGENCY, LAS VEGAS, NEV.

Geothermal environmental assessment: Behavior of selected geothermal brine contaminants in
                                                                        p0113 N82-13541
         [DE82-000238]
                                                                                                                            plants and soils
                                                                                                                  [PB81-222333] p0015 N82-11671 ESCHER WISS G.M.B.H., RAVEWSBURG (WEST GERMANY).
E-TECH, INC., ATLANTA, GA.
Investigation of direct expansion in ground
         source heat pumps [DE81-024139]
                                                                                                                        Air circuit with heating pump [BMFT-FB-T-80-188]
                                                                                                                                                                                          p0017 N82-12404
                                                                        p0012 N82-11418
      , INC., BL SEGUNDO, CALIF.
Crystallized fly-ash feasibility study
                                                                                                                  EXXON RESEARCH AND ENGINEERING CO., PLORHAM PARK,
                                                                       P0009 N82-10599
         [EPRI-EL-1836]
                                                                                                                        Control of utility boiler and gas turbine
EDGERTON, GERNESHAUSEN AND GRIER, INC., IDAHO
PALLS, IDAHO.

INEL goethermal environmental program
                                                                                                                            pollutant emissions by combustion
                                                                                                                            modification, phase 2
                                                                                                                                                                                          p0015 N82-11654
                                                                                                                            F PB81-2222671
      pG008 N82-10591
Alcohol fuels in the United States
                                                                        p0010 N82-11265
         [DE81-026013]
      Innovative equipment for small-scale hydro
                                                                                                                  FINNISH METROROLOGICAL INST., HELSINKI.
                                                                                                                        Sulfur in the air in the capital (Helsinki) metropolitan area: ITASAT-project
          developments
          [ DE81-027820 ]
                                                                        p0141 N82-12634
      DOE small-hydropower demonstration program
                                                                                                                                                                                          p0025 N82-13553
                                                                                                                            [RB-614.71]
                                                                                                                  FLORIDA UNIV., GAINESVILLE.

Effects of low temperature periodic annealing on
         [DE81-027819]
                                                                        p0020 N82-12636
      Micro-hydropower in the United States
[DE81-028271] P0031 N82-
ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIP.
                                                                        p0031 N82-15567
                                                                                                                            the deep-level defects in 200 keV proton
                                                                                                                            irradiated AlGaAs-GaAs solar cells
                                                                                                                  p0061 A82-18287
PLUIDYNE ENGINEERING CORP., MINNEAPOLIS, MINN.
MHD oxidant intermediate temperature ceramic
      Workshop proceedings: U-bend tube cracking in
steam generators
[DE81-903765] p0142 W82-1
                                                                        p0142 N82-13515
RMMANUEL COLL., BOSTON, MASS.
Proposed experimental studies for assessing
                                                                                                                            heater study
                                                                                                                            [NASA-CR-165453]
                                                                                                                  PORD AEROSPACE AND COMMUNICATIONS CORP., NEWPORT
          ionospheric perturbations on SPS uplink pilot
                                                                                                                  BEACH, CALIF.

The effect of concentrator field layout on the
          beam signal
                                                                        p0147 N82-12543
                                                                                                                            EE-1 small community solar power system
ENERGY AND ENVIRONMENTAL ANALYSIS, INC., ARLINGTON,
                                                                                                                                                                                          p0048 A82-11799
     Impact of fuel-economy shortfall: Trends in
technology-weighted FPA versus on-road MPG.
                                                                                                                        Development of a solar receiver for an organic
                                                                                                                            Rankine cycle engine
                                                                                                                        p0048 A82-11800 Control system development for a 1 MW/e/ solar thermal nower plant
          Periodic analysis memorandum no. 1
         [DE81-030841]
                                                                        p0020 N82-12667
ENERGY AND ENVIRONMENTAL RESEARCH CORP., SANTA ANA,
                                                                                                                            thermal power plant
                                                                                                                  POSTER-HILLER ASSOCIATES, INC., WALTHAM, MASS.
Design and development of a reciprocating
      Soot formation in synthetic fuel droplets
                                                                        p0092 N82-10150
         [DE81-028391]
      Assessment of pulverized-coal-fired combustor
                                                                                                                           low-temperature freon expander
                                                                                                                            [ DE81-028609 ]
         performance
                                                                                                                                                                                          p0023 N82-13392
         [DE81-030860]
                                                                        p0105 N82-12187
                                                                                                                   PUTURES GROUP, GLASTONBURY, CONN.
ENERGY/DEVELOPMENT INTERNATIONAL, PORT JEFFERSON,
                                                                                                                        An assessment of nonfossil hydrogen
                                                                                                                           [ PB81-246522 ]
                                                                                                                                                                                          p0087 N82-15231
      Energy and development in Central America.
         Volume 1: Regional assessment [PB81-231540]
                                                                        p0032 N82-15589
                                                                                                                  GALAXY, INC., WASHINGTON, D.C.
Update on Specified European R and D Efforts.
Part 1: Appendices
[DE81-026404] p0143 N82-
      Energy and development in Central America.
         Volume 2: Country assessments
          [ PB81-231557 ]
                                                                        p0032 N82-15590
ENERGY, INC., IDAHO FALLS, ICAHO.
                                                                                                                                                                                          p0143 N82-13983
      Energy recovery from municipal waste development program for Idaho Falls, Idaho [DE81-029999] p0028 N82-146
                                                                                                                  GAS RESEARCH INST., CHICAGO, ILL.
An assessment of nonfossil hydrogen
[PB81-246522]
                                                                                                                                                                                          p0087 N82-15231
[DE81-029999] p0028 N82-14659
EMERGY RESOURCES CO., IMC., CAMBRIDGE, MASS.
Potential environmental problems of enhanced oil
                                                                                                                        Liquid natural gas rapid phase transitions [PB81-244774] p0118 No
                                                                                                                  GENERAL ACCOUNTING OFFICE, WASHINGTON, D. C. Status of the Great Plantage of the Great P
Potential environmental problems of enhanced and gas recovery techniques
[PB81-240186] p0034 N8:

ENGELHARD INDUSTRIES, INC., EDISON, N.J.

Develop and test fuel cell powered cn-site integrated total energy system. Phase 3:

Full-scale power plant development
[NASL-CR-165328]
                                                                                                                        Status of the Great Plains coal gasification plant [EMD-81-64] p0107 N82-12242
                                                                        p0034 N82-15637
                                                                                                                  GENERAL ATOMIC CO., SAN DIEGO, CALIF.

The GA sulfur-iodine water-splitting process - A
                                                                                                                           status report
         [NASA-CR-165328]
                                                                        p0142 N82-13490
```

GENERAL DYNAMICS/CONVAIR, SAN DIEGO, CALIF.	Investigation of mechanisms of hydrogen transfer
Study of multi-megawatt technology needs for	in coal hydrogenation
photovoltaic space power systems. Volume 1:	[DE81-030492] p0099 N82-11165
Executive summary	GULF SCIENCE AND TECHNOLOGY CO., PITTSBURGH, PA.
[NASA-CR-165323-VOL-1] p0078 N82-14636	Effects of components of synfuels on soot formation
Study of multi-megawatt technology needs for photovoltaic space power systems, volume 2	[DE81-027961] p0101 N82-11242
[NASA-CR-165323-VOL-2] p0078 N82-14637	GULP UNIVERSITIES BESEARCH CONSORTION, BELLAIRE, TEX.
GENERAL RLECTRIC CO., ST. PETERSBURG, PLA.	Relational methodology for integrating and
Experimental evaluation of the steady-state and	analyzing field test and research data
dynamic performance characteristics of the	describing enhanced oil recovery
interactive units of a coal-gasification process [DE81-028995] pC094 B82-10259	[DE81-030441] p0118 N82-15508
Water-cooled gas turbine development program	u
[DB81-904245] p0136 N82-10406	П
GENERAL ELECTRIC CO., WILMINGTON, MASS.	HABSEB (JAMES) AND ASSOCIATES, SPRINGFIELD, VT.
Development status of a regenerative fuel cell	Peasibility of a small scale pumped storage
system for orbital operation	demonstration project, Hibbing, Minnesota [DE81-028678] p0155 N82-10525
GEOKINETICS, INC., CONCORD, CALIF.	[DE81-028678] P0155 N82-10525 HART (FRED C.) ASSOCIATES, INC., NEW YORK, N.Y.
Meteorological and climatological investigation:	Methodology for determining the impact of
Review of January - June 1980 investigative	environmental regulatory programs
period	[DE81-903429] p0009 N82-10594
[DB81-030740] p0111 N82-12731	HARVARD UNIV., CAMBRIDGE, MASS.
GEOLOGICAL SURVEY, CHAMPAIGE, ILL.	Optimization of transparent electrode for solar
Coal fly ash: A review of the literature and proposed classification system with emphasis	cells [DE81-023359] p0063 N82-10507
on environmental impacts	Relaxing environmental standards during
[PB81-215014] p0009 N82-10608	oil-supply disruptions: Past, present and
GEOLOGICAL SURVEY, DENVER, COLO.	future
Geologic applications of thermal-inertia mapping	[DB81-024250] p0009 N82-10601
from satellite [E82-10011] p0118 N82-15489	Case studies in the application of air quality
[E82-10011] p0118 H82-15489 GEOLOGICAL SURVEY, INDIANAFOLIS, IND.	modelling in environmental decision making: Summary and recommendations
Effects of coal fly-ash disposal on water	[PB81-213233] p0009 x82-10605
quality in and around the Indiana Cunes	HIBBING PUBLIC UTILITIES COMMISSION, MINN.
National Lakeshore, Indiana	Peasibility of a small scale pumped storage
[PB81-238479] p0034 N82-15624	demonstration project, Hibbing, Minnesota
GEOLOGICAL SURVRY, WASHINGTON, D. C. Biogeochemical evidence for subsurface	[DE81-028678] p0155 N82-10525 HOBEYWELL, INC., BLOOMINGTON, MINN.
hydrocarbon occurrence, recluse oil field,	Low cost silicon-on-ceramic photovoltaic solar
Wyoming: Preliminary results	cells
[USGS-CIRC-837] p0110 N82-12693	p0059 A82-17098
GEORGETOWN UNIV., WASHINGTON, D.C.	HORSTHANN G.M.B.H., HEILIGENHAUS (WEST GERMANY).
Industrial application of fluidized-bed combustion	A central microprocessor controlled electrical
[DE81-030272] p0105 N82-12182 GEORGIA IBST. OF TECH., ATLANTA.	storage heating system [BMFT-FB-T-80-182] p0025 N82-13547
Cooperative program of applied energy research	HOUSTON UNIV., TEX.
technology development	Two-phase flow in geothermal energy sources
[DE81-028916] p0007 N82-10517	[DE81-029037] p0103 N82-11404
An assessment of selected solar energy industry	Solid-solid reactions in coal conversion processes
activities [PB81-222424] p0071 N82-11623	p0107 N82-12238 HUGHES RESEARCH LABS., MALIBU, CALIF.
Considerations for high accuracy radiation	Towards a high-temperature solar electric
efficiency measurements for the Solar Power	converter
Satellite (SPS) subarrays	p0056 A82-15903
p0148 N82-12559	Effects of low temperature periodic annealing on
GEOTRANS, INC., HERNDON, VA. Review of simulation techniques for Aquifer	the deep-level defects in 200 keV proton irradiated AlGaAs-GaAs solar cells
Thermal Energy Storage (ATES)	p0061 A82-18287
[DB81-029943] p0156 N82-10532	Study of radiatively sustained cesium plasmas
GERSHAM, BRICKNER AND BRATTON, INC., WASHINGTON, D.C.	for solar energy conversion
Waste-to-energy Systems Institutional Barriers	[NASA-CR-166265] p0075 N82-13039
Assessment Workshop [DE82-000098] p0019 N82-12621	HYDROCARBON RESEARCH, INC., LAWRENCEVILLE, N. J. H-coal process improvement study. Bench unit
GILBERT/COMMONWEALTH, READING, PA.	baseline run with preheater/reactor
Magnetohydrodynamics MHD Engineering Test	[DE81-026022] p0094 N82-10260
Pacility ETF 200 MWe power plant. Conceptual	
Design Engineering Report CDER. Volume 3:	
Costs and schedules [NASA-CR-165452-VOL-3] p0137 N82-10495	IDAHO MATIONAL ENGINEERING LAB., IDAHO PALLS.
[NASA-CR-165452-VOL-3] p0137 N82-10495 Magnetohydrodynamics (MHD) Engineering Test	Corrosion testing of carbon steel in aereated
Facility (ETF) 200 MWe power plant.	geothermal brine
Conceptual Design Engineering Report (CDER).	[DE81-028653] p0093 N82-10201
Volume 1: Brecutive summary	ILLINOIS INST. OF TECH., CHICAGO.
[NASA-CR-165452-VOL-1] p0140 N82-12570	Separation of particles from coal derived
GILBERT (GLEN A.) AND ASSOCIATES, INC., READING, PA. Modular hydro dam approach to the economic	liquids via surface charge properties [DE81-029088] p0092 N82-10141
development of ultra low-head hydropower	ILLINOIS UBIV. AT CHICAGO CIRCLE, CHICAGO.
[DE81-027817] p0019 N82-12635	
	Vertical combustor for refuse combustion
GOETTINGER UNIV. (REST GERNARY).	[DE81-030002] p0098 N82-11152
GORTTINGER UNIV. (BEST GERMANY). Geomagnetic and magnetotelluric soundings in the	[DE81-030002] p0098 N82-11152 INDIANA UNIV., BLOCKINGTON.
GORTTINGER UNIV. (MEST GERMANY). Geomagnetic and magnetotelluric soundings in the area of the Central European rift system	[DE81-030002] p0098 M82-11152 INDIANA UNIV., BLOCKINGTON. Comparison of Michigan Basin crude oils
GORTTINGEM UNIV. (MEST GERMANY). Geomagnetic and magnetotelluric soundings in the area of the Central European rift system [BMFT-FB-T-81-111] p0119 M82-15656	[DE81-030002] p0098 N82-11152 INDIANA UNIV., BLOCKINGTON. Comparison of Michigan Basin crude oils p0091 A82-17007
GORTTINGER UNIV. (MEST GERMANY). Geomagnetic and magnetotelluric soundings in the area of the Central European rift system	[DE81-030002] p0098 M82-11152 INDIANA UNIV., BLOCKINGTON. Comparison of Michigan Basin crude oils
GOETTINGEN UNIV. (NEST GERMANY). Geomagnetic and magnetotelluric soundings in the area of the Central European rift system [BMFT-FB-T-81-111] GULP RESEARCH AND DEVELOPMENT CO., PITTSBURGH, PA. Underground gasification of steeply dipping beds. Phase 2 report: Eesults of Eawlins test	[DE81-030002] p0098 N82-11152 INDIANA UNIV., BLOCKINGTON. COMPARISON Of Michigan Basin crude oils p0091 A82-17007 INSTITUT FUER KEMTECHNIK UND BURRGIRWANDLUNG E.V., STUTTGART (WEST GERMANY). Development of a modular heat exchanger with
GORTTINGEN UNIV. (BEST GERMANY). Geomagnetic and magnetotelluric soundings in the area of the Central Buropean rift system [BMFT-FB-T-81-111] p0119 M82-15656 GULP RESEARCH AND DEVELOPMENT CO., PITTSBURGH, PA. Underground gasification of steeply dipping	[DE81-030002] p0098 N82-11152 INDIANA UNIV., BLOCKINGTON. COMPARISON OF Michigan Basin crude oils p0091 A82-17007 INSTITUT PUER KENTECHNIK UND EMERGIRWANDLUNG E.V., STUTTGART (WEST GERNANY).

Electrochemical photovoltaic cells	ILL.
[DB81-769704]	p0066 N82-10568
Development of hydroconversion of	
synthetic fuels	p0108 N82-12260
[DE81-030954] INTERA ENVIRONMENTAL CONSULTANTS LTD.	
Review of simulation techniques fo	
Thermal Energy Storage (ATES)	-0456 800 4050
[DE81-029943] INTERNATIONAL ENERGY AGENCY, PARIS (F	p0156 N82-10532
Optimization of solar heating and	
[NP-1903997]	p0072 N82-12599
INTERNATIONAL SCIENCE AND TECHNOLOGY	INST., INC.,
MASHINGTON, D. C. Assessment of oil-shale technology	ın Brazıl
[DE81-027574]	P0010 N82-11249
INTERNATIONALE ATOMBEAKTORBAU GESELLS	CHAPT,
BENSBERG (WEST GERMANY). Gas cooled solar power plant for q	enerating
electrical energy in the 20MWe of	perating range
(GAST): Preliminary design phas	e
[BMFT-FB-T-81-097] IOWA STATE UNIV. OF SCIENCE AND TECHN	P0080 N82-15530
	A Anna
chemical-processing perspective	
[DE81-025452]	pC022 N82-13191
IOWA UNIV., OAKDALE. Stratigraphy and depositional hist	orv of the
Iola Limestone Upper Pennsylvani	
(Missourian), Northern Midcontin	ent U.S.
	p0116 N82-14711
•	
J	
JET PROPULSION LAB., CALIPOENIA INST.	OF TECH.,
PASADENA. An experimental study of SO3 disso	ciation as a
mechanism for converting and tra	nsporting
solar energy	
Cook and numbers on supplementations of	p0043 A82-11214
Cost and performance projections f photovoltaic blankets	OL SPS
<u></u>	p0045 A82-11741
High performance silicon sclar arr	ays employing
advanced structures	p0045 A82-11758
Nonimaging concentrators for photo	
in space	
High efficiency thin-film GaAs sol	
	p0046 A82-11761
arya ciricicacy thin tirm ound but	ar cells
Secondary concentrators for parabo	ar cells p0046 A82-11767
	ar cells p0046 A82-11767 lic dish solar
Secondary concentrators for parabothermal power systems	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798
Secondary concentrators for parabothermal power systems	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy -
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology development AIAA PAPER 81-25301	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology development [AIAA PAPER 81-2530] Development, solar test, and evalued the system of the status and second test.	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evaluhigh-temperature air receiver for	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology development [AIAA PAPER 81-2530] Development, solar test, and evalued the system of the status and second test.	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evaluhigh-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003 testing in the
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver fo point-focusing parabolic dish ap [AIAA PAPEE 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPEE 81-2534]	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003 testing in the
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evaluhigh-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003 testing in the
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photov	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003 testing in the p0054 A82-14005 ar receivers p0054 A82-14015
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552]	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003 testing in the p0054 A82-14005 ar receivers p0054 A82-14015 oltaic solar
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photow cells	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003 testing in the p0054 A82-14005 ar receivers p0054 A82-14015 oltaic solar
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photov cells High performance solar Stirling sy [AIAA PAPER 81-2554]	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14005 testing in the p0054 A82-14015 oltaic solar p0059 A82-17098 stem p0061 A82-18222
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver fo point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photov cells High performance solar Stirling sy [AIAA PAPER 81-2554] Configuration selection study for	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14005 testing in the p0054 A82-14015 oltaic solar p0059 A82-17098 stem p0061 A82-18222
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photov cells High performance solar Stirling sy [AIAA PAPER 81-2554] Configuration selection study for using parabolic dish modules	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14005 testing in the p0054 A82-14015 oltaic solar p0059 A82-17098 stem p0061 A82-18222 isolated loads
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photov cells High performance solar Stirling sy [AIAA PAPER 81-2554] Configuration selection study for using parabolic dish modules [AIAA PAPER 81-2549]	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14005 testing in the p0054 A82-14015 oltaic solar p0059 A82-17098 stem p0061 A82-18222
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photow cells High performance solar Stirling sy [AIAA PAPER 81-2554] Configuration selection study for using parabolic dish modules [AIAA PAPER 81-2549] Solar energy modulator [NASA-CASE-NPO-15368-1]	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14005 ar receivers p0054 A82-14015 oltaic solar p0059 A82-17098 stem p0061 A82-18222 isolated loads p0061 A82-18223
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photov cells High performance solar Stirling sy [AIAA PAPER 81-2554] Configuration selection study for using parabolic dish modules [AIAA PAPER 81-2549] Solar energy modulator [NASA-CASE-NPO-15388-1] Fluidized bed coal combustion reac	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14005 testing in the p0054 A82-14015 oltaic solar p0059 A82-17098 stem p0061 A82-18223 p0061 A82-18223
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photovicells High performance solar Stirling sy [AIAA PAPER 81-2554] Configuration selection study for using parabolic dish modules [AIAA PAPER 81-2549] Solar energy modulator [NASA-CASE-NPO-15368-1] Pluidized bed coal combustion reace [NASA-CASE-NPO-14273-1]	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003 testing in the p0054 A82-14015 oltaic solar p0059 A82-17098 stem p0061 A82-18222 isolated loads p0061 A82-18223 p0063 N82-10496 tor p0097 N82-11144
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photow cells High performance solar Stirling sy [AIAA PAPER 81-2554] Configuration selection study for using parabolic dish modules [AIAA PAPER 81-2549] Solar energy modulator [NASA-CASE-NPO-15388-1] Fluidized bed coal combustion reac	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003 testing in the p0054 A82-14015 oltaic solar p0059 A82-17098 stem p0061 A82-18222 isolated loads p0061 A82-18223 p0063 N82-10496 tor p0097 N82-11144
Secondary concentrators for parabothermal power systems Advanced high temperature thermoel space power Control of new energy sources in a utility system Dish concentrators for sclar therm Status and technology developmen [AIAA PAPER 81-2530] Development, solar test, and evalu high-temperature air receiver for point-focusing parabolic dish ap [AIAA PAPER 81-2532] Solar concentrator panel and gore JPL 25-foot space simulator [AIAA PAPER 81-2534] Use of ceramics in point-focus sol [AIAA PAPER 81-2552] Low cost silicon-on-ceramic photovells High performance solar Stirling sy [AIAA PAPER 81-2554] Configuration selection study for using parabolic dish modules [AIAA PAPER 81-2549] Solar energy modulator [NASA-CASE-NPO-15388-1] Fluidized bed coal combustion reac [NASA-CASE-NPO-14273-1] Coal desulfurization by low temper	ar cells p0046 A82-11767 lic dish solar p0048 A82-11798 ectrics for p0125 A82-11823 n electric p0154 A82-13082 al energy - t p0053 A82-14001 ation of a r plications p0053 A82-14003 testing in the p0054 A82-14015 oltaic solar p0059 A82-17098 stem p0061 A82-18222 isolated loads p0061 A82-18223 p0063 N82-10496 tor p0097 N82-11144

Assessment of advanced coal gasification processes [NASA-CR-164949] p0098 N82-11146 Practure mechanics of cellular glass [NASA-CR-164959] p0066 N82-11209 An optimization model for energy generation and distribution in a dynamic facility p0011 N82-11310 Geologic considerations in underground coal mining system design [NASA-CR-164961] p0104 N82-11516 The effects of impurities on the performance of silicon solar ceils
[NASA-CR-164945] p0067 N82-115 p0067 N82-11548 Irrigation market for solar thermal parabolic dish systems [NASA-CR-164955] Secondary and compound concentrators for parabolic dish solar thermal power systems p0068 N82-11550 [NASA-CR-164960] Evaluation of the micro-carburetor p0016 N82-11994 [NASA-CR-164958] Hydrodesulfurization of chlorinated coal p0107 N82-12240 [NASA-CASE-NPO-15304-1] Supercritical multicomponent solvent coal extraction P0107 N82-12241 [NASA-CASE-NPO-15767-1] Rectenna array measurement results p0149 N82-12564 Electric and hybrid vehicles environmental control subsystem study
[NASA-CR-164995] p0020 N82-12657 Electric and hybrid vehicle environmental control subsystem study p0020 N82-12658 [NASA-CR-164996] Experimental and analytical investigation of a fluidic power generator [JPL-PUB-81-100] p0142 N82-13386 Space applicable DOE photovoltaic technology: An update [NASA-CR-165021] Distributed photovoltaic systems: Utility interface issues and their present status
[NASA-CR-165019] p0076 N8 p0076 N82-13492 A preliminary estimate of future communications traific for the electric power system [NASA-CR-165015] p0024 N82-13493 Dish stirling sclar receiver combustor test program [NASA-CR-165017] p0076 N82-13495 A Module Experimental Process System Development Unit (MEPSDU) p0076 N82-13496 [NASA-CR-165014] High resolution, low cost solar cell contact development [NASA-CR-165032] p0076 N82-1: Controlled Speed Accessory Drive demonstration p0076 N82-13501 program [NASA-CR-165010] p0026 N82-13981 The Seasat commercial demonstration program p0115 N82-14561
JOINT PUBLICATIONS RESEARCH SERVICE, ARLINGTON, VA. Solar project at Almeria nears completion p0075 N82-12647 German-Argentine experiment: Vertical-rotor p0141 N82-12648 K saving heat supply system for the residential district "Maria Lindenhof" in Dorsten, West

KA-PLANUNGS G.M.B.H., HEIDELBERG (WEST GERMANY).

Preliminary investigation on a primary energy saving heat supply system for the residential district "Maria Lindenhof" in Dorsten, West Germany

[BMPT-FB-T-80-157] p0008 N82-10572

KERR-MCGER CORP., OKLAHOMA CITY.

Process development for improved SRC options.

Kerr-McGee critical solvent deashing and fractionation studies

[DE81-903785] p0114 N82-14380

KHD HUMBOLDT WEDAG A.G., COLOGNE (WEST GERMANY).

Baking of carbon anodes for the electrolysis of aluminum by electric resistance heating

[BMPT-FB-T-81-168] p0030 N82-15168

KVB, INC., IRVINE, CALIF.

Baseline data on utilization of low-grade fuels in gas turbine applications. Volume 3:

Emissions evaluation

[DE81-903764] p0006 N82-10254

L
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
Performance of terrestrial photovoltaic modules
at MIT Lincoln Laboratory experimental
photovoltaic systems
[DB81-029995] p0064 N82-10519
Testing and evaluation of a solar photovoltaic flywheel energy storage system
[DOB/ET-20279/130] p0065 N82-10558
Carlisle house: An all-sclar electric residence
[DOE/ET-20279/133] pCC71 N82-11622
Data report for the northeast residential
experiment station, June 1981
[DE82-000068] pCC77 W82-13533
Photovoltaic systems performance experience [DE81-025725] pCC79 N82-14656
Solar Photovoltaic Residential Project. Project
Integration Meeting, Agenda and Abstracts
[DE81-028433] pCC79 N82-14657
LINCOLN LAND COMMUNITY COLL., SPRINGPIRED, ILL.
Alcohol fuels grant program at Lincoln Land
Community College, Springfield, Illinois
[DE82-000744] p0114 N82-14375 LINCON CORP., PASADENA, CALIF.
Performance analysis and simulation of the SPS
reference phase control system
p0071 H82-12544
Coherent multiple tone technique for ground
based SPS phase control
P0147 N82-12546
LITTLE (ARTHUR D.), INC., CAMBRIDGE, MASS. Large wind turbine generator performance
assessment, technology status report no. 3
[DE81-903763] pC137 N82-10524
Assessment of I.C. engines as drivers for heat
actuated heat pumps
[DB81-024086] p0139 N82-11421
LOCKHEED-CALIFORNIA CO., BURBANK. Experimental study of fuel heating at low
temperatures in a wing tank model, volume 1
[NASA-CR-165391] p0100 N82-11224
LOCKHERD ENGINEERING AND MANAGEMENT SERVICES CO.,
INC., HOUSTON, TEX.
Design and breadboard evaluation of the SPS
reference phase control system concept
p0072 N82-12545 Investigation of the application of remote
sensing technology to environmental monitoring
[E82-10010] p0030 N82-15488
LOS ALAMOS SCIENTIFIC LAB., N. MEX.
Development of newer methods for the isolation
and identification of certain components found
in complex mixtures derived from energy sources and the determination of their
biological activity via bioassay systems
[DB81-028311] pC092 N82-10148
Development of man-made geothermal reservoirs
[LA-UR-81-852] p0097 N82-10480
State of the art in passive solar heating
[LA-UR-81-2185] p0065 N82-10537 Los Alamos National Laboratory Passive Solar
Program
[DE81-028778] p0065 N82-10538
Hot dry rock geothermal energy development program
[LA-UR-81-1265] p0097 N82-10560
Design considerations for vehicular fuel cell
power plants [DE81-769737] p0138 N82-10961
[DE81-769737] p0138 M82-10961 Hydrogen storage-bed design for tritium systems
test assembly
[DE81-025336] pC086 N82-11262
Test results and analysis of a convective loop
solar air collector
[DE81-028151] p0070 N82-11599 Long-term performance of the Hunn passive solar
residence
[DB81-028735] p0070 N82-11600
Heat storage duration
[DB81-026635] pC070 N82-11602
Relaxation of geothermal-reservoir stresses
induced by heat production
[DE81-032024] p0105 N82-11715
Uncertainties associated with inertial-fusion

National coal-market conditions for the year 2000: Regional-issue identification and analysis, high scenario [DE81-026425] p0016 N82-11988 Ionospheric power beam studies p0147 N82-12542 Passive-solar-retrofit study for the United States Navy (DE81-028921 1 p0074 N82-12629 Economic implications of passive-solar retrofit for single-family residences in Albuquerque, New Mexico: A case study [DE81-028402] p0074 N82-12630 Space nuclear safety and fuels program p0111 N82-12921 Spectra over complex terrain [DE81-028734] p0112 N82-13473 Environmental and radiological safety studies: Interaction of (238) PuO2 heat sources with terrestrial and aquatic environments [DE81-032019] p0025 N82-13565 Chemical element concentrations in liquids and solids associated with power plants using PGD systems [DE81-030422] p0027 N82-14322 Cool-down flow-rate limits imposed by thermal stresses in LNG pipelines [DE81-028731] Pailure mode analysis using state variables derived from fault trees with application Use of oxide decompositions in advanced thermochemical hydrogen cycles for solar heat sources. Application of the tricobalt tetraoxide-cobalt monoxide pair [DE8 1-030235] [DE81-030235] p0082 N82-15581 Schlumberger resistivity study of the Jemez Springs region of northwestern New Mexico p0119 N82-15661 [DE81-025302] LOS ALAHOS TECHNICAL ASSOCIATES, INC., N. MEX.
The severity of institutional barriers affecting energy-from-municipal-waste technologies [DE82-000133] p0018 N82-12583 LOS ANGELES COUNTY SANITATION DISTRICT, WHITTIBE, CALIF. - Parallel evaluation of air-and oxygen-activated sludge [PB81-246712] p0034 N82-15633 LOUISIANA STATE UNIV. AND ASM COLL., BATOM ROUGE.
Methane production from alkaline food waste p0092 N82-10115 LOVELACE BIOMEDICAL AND ENVIRONMENTAL RESEARCH INST., ALBUQUERQUE, N. MEX.
LOW-Btu-gasifier emissions toxicology p0014 N82-11651 [DE81-031000] LUDWIG-MAXIMILIANS-UNIVERSITAET, MUNICH (WEST GERMANY) . Improvement of thermal efficiency of flat plate solar collectors [BMFT-FB-T-80-194] p0075 N82-12642 MARYLAND UNIV., COLLEGE PARK. Selected studies of four high-temperature air-pollution sources

p0015 N82-11680 MASSACHUSETTS INST. OF TECH., CAMBRIDGE. Flow aerodynamics modeling of an MHD swirl combustor - Calculations and experimental verification p0127 A82-12113 Integration of decentralized generators with the electric power grid [DE81-029731] p0006 N82-10334 OESYS: A simulation tool for nonconventional energy applications analysis. Theoretical and operational description with user documentation [DE81-029701] P0007 N82-10514 Key contributions in MHD power generation [DE81-028121] p0138 N82-10882 Oceans and ocean currents: Their influence on climate [DE81-027263] p0016 N82-11731 RF-driven Tokamak reactor with sub-ignited, thermally stable operation [DE81-029437] p0139 N82-11935

Photovoltaic market analysis program: Background, model development, applications and extensions (DE81-029711) p0073 N82-12609 Cost goals for a residential photovoltaic/thermal liquid collector system set in three northern locations p0073 N82-12610 [DE81-029700] Conceptual design of superconducting magnet system for Magnetohydrodynamic (MHD) Engineering Test Facility (ETF) 200 MWe power p0143 N82-14520 [NASA-CR-165053] Liquid natural gas rapid phase transitions p0118 N82-15232 F PB81-2447741 MASSACHUSETTS INST. OF TECH., OAK RIDGE, TENN.
Aluminum recovery from fly ash and shale-retort p0099 N82-11154 FDE81-0276751 MATHIBEH, INC., PRINCETON, N. J.
Environmental impacts of energy transportation p0025 N82-13559 [DE82-900316] MAZRIA (EDWARD) AND ASSOCIATES, ALBUQUERQUE, N. MEX. Passive solar technical planning study PC072 N82-12578 [EPRI-EM-1591] MCDONNELL-DOUGLAS CORP., BUHTINGTON BEACH, CALIF.
Second generation heliostat, volume 1
[DE81-029618] p0069 N82-1 p0069 N82-11564 MECHANICAL TECHNOLOGY, INC., LATHAM, N. Y.
Electric and hybrid vehicles environmental control subsystem study p0020 N82-12657 [NASA-CR-164995] MERIX CORP., WELLESLEY, MASS.
Energy conservation in distillation [DE81-028650] [DE81-028650] P0018 N82-12581 MESSERSCHMITT-BOELKOW-BLOHM G.M.B.H., OTTOBRUNN (WEST GERMANY). Technological activities for high performance receivers [BMFT-FB-T-80-133] p0066 N82-10571 Organic fluids for the practical use in energy conversion systems of solar power plants p0080 N82-15537 [BMFT-FB-T-81-154] Comparison of concepts for solar-heated or solar-driven absorption and compression cooling machines for air conditioning and food preservation purposes, phase 1 [BHTT-FB-T-81-165] p008
MICHIGAN UNIV., ANN ARBOR.
Comparison of Michigan Basin crude oils p0080 N82-15541 p0091 A82-17007 Study of the formation of submicron particulates generated by coal combustion p0008 N82-10586 [DB81-027447] MID-AMERICAN SOLAR ENERGY COMPLEX, BLOCKINGTON, MINN. MASEC SOLAR 80 home designs
[DE81-028344] p0067 N82-11316
MID-AMERICAN SOLAR ENERGY COMPLEX, MINNEAPOLIS, MINN. Quarterly report of solar federal buildings program in the MASEC region p0062 N82-10276 [DE81-027968] Summary of passive-solar-retrofit workshops [DE81-028146] p0065 N82 MASEC industrial fuel-wood program p0065 N82-10547 [DE82-000461] p0110 N82-12595 Wood resources and utilization patterns in the North Central Region and energy needs for the manufacture of wood products [DE81-030356] p0019 N82-12604 Solar Energy Information Data Bank (SEIDB) program, FY 1981 [DE81-030054] Interactive model to assess economics of anaerobic digestion of the farm [DE82-000452] p0110 N82-12620 Seminars for private college administrators on solar applications for college buildings [DE81-027981] p0079 N82-14661 Solar energy training program for code enforcement personnel [DE81-030053] p00 p0081 N82-15563 Summary of passive solar multi-family design workshops [DE81-030353] pCC81 N82-15564 MIDWEST RESPARCH INST., GCLDEN, COLO.
Alcohol fuels bibliography, 1901 - March 1980
[DE81-025482] p0095 N82p0095 N82-10263

Optimization of transparent electrode for solar cells FDE81-0233591 p0063 N82-10507 Standards application and development plan for solar thermal technologies [DE81-030310] p0065 N82-10534 Energy end-use requirements in manufacturing, volume 3 (DE81-027976) p0007 N82-105 Rapid charging of lead-acid batteries for electric-webicle propulsion and solar-electric p0007 N82-10544 storage [DE81-028084] p0157 N82-10548
Fabrication, testing, and modeling plans for a
125-kW counter-rotating-turbine wave energy [DE81-028084] converter [DE81-023946] p0137 N82-10559 Application of solar thermal energy to buildings and industry [SERI/TP-641-1222] p0066 N82-10563 Measured performance of falling-jet flash evaporators [DE81-024355] p0161 N82-10565 User needs for solar decision-making tools: The homebuilding industry p0067 N82-11325 [DE81-027293] Parametric sensitivity study for solar-assisted heat-pump systems [DE81-030309] p0067 N82-11407 Amorphous boron-silicon-hydrogen alloys for thin-film heterojunction solar cells p0068 N82-11558 [DE81-027254] Zn3P2 as an improved semiconductor for photovoltaic solar cells [DE81-025587] p0069 N82-11577 Use of solar thermal energy to generate electricity [DE81-028797] p0070 N82-11606 national photovoltaic program in amorphous materials [DE81-025906] D0070 N82-11609 Ocean energy-waves, currents, and tides [DE81-025708] p010 p0105 N82-11611 Comparison of residential window distributions and effects of mass and insulation [DE81-027938] p0017 N82-12283 Near-term improvements in parabolic troughs: An economic and performance assessment [DE82-001158] p0 p0073 N82-12615 Examining some Flexibilities in passive design: limiting solar myths [DE81-028401] p0073 N82-12623 Performance analysis of 11 Denver Metro passive homes [DE81-025473] Summertime results from the class B passive-solar performance-monitoring program p0074 N82-12627 [DE81-025471] Solar explosion [DE81-026086] p0074 N82-12628 Costs for alternative grain-residue-collection systems [DE81-029072] p0110 N82-12633 Appliance efficiency and the solar building [DE81-029072] [DE81-029073] p0075 N82-13265 Inexpensive thermographic techniques for determining reliable solar-collector-array performance [DE82-001151] p0076 N82-13528 Solar thermal energy systems [DE81-029295] p0077 N82-13531 New and renewable energy in the United States of America [DE81-030887] p0024 N82-13539 Systems analysis of thermal storage [DE81-030288] [DE81-030208] p0079 N82-14658 Low-cost passive-solar retrofits for new and existing mobile homes [DE81-028356] p0081 N82-15544 Industrial process heat applications for solar thermal technologies [DE81-025934] p0081 N82-15545 Design and economics of direct-contact salt hydrate storage systems [SERI/TP-631-1163] p0160 N82-15558

Photoelectrochemical solar cells: Stabilization of small-band-gap semiconductor in aqueous solution by surface-attached organic conducting polymer [DE81-030312] p0081 N82-15569 SERI Solar-Energy-Storage Program p0082 N82-15576 [DE81-029476] Overview and FY 1981 progress on open-cycle OTEC · power systems [DE81-029277] p0144 N82-15580 HIDWEST RESEARCH INST., KANSAS CITY, NO. Energy end-use requirements in manufacturing, volume 1 [DE81-028975] p0064 N82-10512 Investigation of photovoltaic mechanisms in polycrystalline thin-film solar cells p0065 N82-10539 [DB81-027272] MIDWEST RESEARCE INST., PERTH (AUSTRALIA).
Status of solar energy research and development in Australia p0073 N82-12611 [NP-1903916] MINISTRY OF HOUSING, OTTAWA (ONTARIO).

Residential site design and energy conservation. Part 1: General report [DE81-904010]
MINNESOTA GAS CO., MINNEAPCLIS. p0027 N82-14398 Peat biogasification development program p0101 N82-11243 [DE81-028299] MINNESOTA GEOLOGICAL SURVEY, ST. PAUL. Moorhead district heating, phase 2 [DE81-029689] p0031 N82-15556 MINHESOTA UNIV., HINNEAPOLIS.

Development of peatlands in northern Minnesota
[DE82-000873] p0112 N82-1 p0112 N82-13475 MINNESOTA UNIV., ST. PAUL. Earth shelter 2. 1979-1980 USC series [CONF-800438] p0006 N82-10277 HISSISSIPPI STATE UNIV., MISSISSIPPI STATE. Magnetohydrodynamic research program of the MHD Energy center at Mississippi State University and structural features of MHD radiant boilers [DE81-029901] p0139 N82-11934 Testing and evaluation of MHD materials and substructures p0143 N82-13926 [DE81-024331] MISSOURI RIVER BASIN COMMISSION, OMAHA, NEBR. Synthetic fuel development for the Upper Missouri River Basin. Section 13: Wa Water assessment report p0011 N82-11276 [PB81-224537] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] p0013 N82-11525 MITRE CORP., MCLEAN, VA.
Status of the DOE battery and electrochemical technology program 2 [DE81-029879] p0156 N82-10540 OS energy strategies: Some options for eliminating oil imports by the year 2000 p0014 N82-11626 [PB81-226052] Energy and development in Central America. Volume 1: Regional assessment [PB81-231540] p0032 N82-15589 Energy and development in Central America.
Volume 2: Country assessments [PB81-231557] p0032 N82-15590 MONSANTO RESEARCH CORP., DAYTON, OHIO. Low-cost mirror concentrator based on inflated, double-walled, metallized, tubular films
[DB81-027813] p0081 N82-15551 MONTANA DEPT. OF NATURAL RESOURCES AND CONSERVATION, HELENA. Montana geothermal handbook: A guide to agencies, regulations, permits and financial aids for geothermal development [DE81-024315] p0007 M82-10 p0007 N82-10562 MONTANA STATE UNIV., MISSOULA. Catalytic hydrogenation of coal-derived liquids p0106 N82-12198 [DE81-030485] MOTOROLA, IEC., PHOENIX, ARIZ.
Photovoltaic mechanisms in polycrystalline thin
film silicon solar cells [DE81-030370] D0072 N82-12608 MOURD LAB., MIAMISBURG, OHIO. Pricetown 1 underground coal gasification field test: Operations report [DB81-025162] pc095 882-10 pC095 N82-10268

MUNISING PAPER DIV., NEENAH, WIS.

Development of battery separator composites
[NASA-CR-165508] p0157 N82-11547

N NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.

Maritime support for ocean-resources development [AD-A104730] p0111 N82-12735 Supplement to energy for rural development: Renewable resources and alternative technologies for developing countries [PB81-231011] p0032 N82-15592 NATIONAL ABBONAUTÍCS AND SPACE ADMINISTRATION, WASHINGTON, D. C. Advances in space power research and technology at the National Aeronautics and Space Administration p0122 A82-11755 Energy potential and early operational experience for large wind turbines p0132 182-17627 Technical and economic aspects of hydrogen storage in metal hydrides p0086 N82-11223 [NASA-TH-76610] The storage of hydrogen in the form of metal hydrides: An application to thermal engines [NASA-TH-76609] p0086 N82-11225 Highlights of 1981 activities [NASA-NEWS-RELEASE-81-199] p0161 N82-15008 Aeronautics and space report of the President, 1980 activities [NASA-TM-84079] p0035 N82-16022 NATIONAL ARRONAUTICS AND SPACE ADMINISTRATION.
LYNDON B. JOHNSON SPACE CENTER, HOUSTON, TEX.
Development status of a regenerative fuel cell system for orbital operation Antenna optimization and cost consideration for the Solar Power Satellite microwave system p0145 A82-11744 Solar cell development for the Power Extension Package .D0046 A82-11763 Workshop on Microwave Power Transmission and Reception. Workshop paper summaries [NASA-TH-84064] p0146 N82-12538 System performance conclusions p0146 N82-12539 Session on solid state: Introduction p0149 N82-12565 NATIONAL ARRONAUTICS AND SPACE ADMINISTRATION. LANGLEY RESEARCH CENTER, HAMPTON, VA.
A solar simulator-pumped gas laser for the direct conversion of solar energy p0044 A82-11710 Establishment of noise acceptance criteria for wind turbines p0125 A82-11825 Comparative analyses of space-to-space central power stations p0150 N82-14202 [NASA-TP-1955] Design of an energy conservation building p0027 N82-14632 [NASA-TM-83175] POO27 N8
NATIONAL ARRONAUTICS AND SPACE ADMINISTRATION. LEWIS RESEARCH CENTER, CLEVELAND, OHIO. High power solar array switching regulation p0045 A82-11736 Solar cell development for the Power Extension Package p0046 A82-11763 Gallium arsenide solar cells-status and prospects for use in space p0046 A82-11765 NASA preprototype redox storage system for a photovoltaic stand-alone application p0153 A82-11774 Multijunction high voltage concentrator solar cells p0047 A82-11796 End region and current consolidation effects upon the performance of an MHD channel for the ETF conceptual design p0135 A82-17889 [AIAA PAPER 82-0325] Impact of uniform electrode current distribution

on ETF

[AIAA PAPER 82-0423]

p0135 A82-17941

```
Effect of positive pulse charge waveforms on the
       energy efficiency of lead-acid traction cells
                                                  p0155 N82-10503
       [NASA-TH-82709]
    Levis Research Center's coal-fired, pressurized, fluidized-bed reactor test facility
                                                   p0103 N82-11397
       [ NA SA-TM-8 16 16 ]
    High thermal power density heat transfer
[NASA-CASE-LEW-12950-1] p0139 N82-1
Solar cell development for the power extension
                                                  p0139 N 82-11399
       package
       [NASA-TM-82685]
                                                   p0068 N82-11551
    Magnetohydrodynamics (MHD) Engineering Test
Pacility (ETP) 200 MWe power plant. Design
                                                       Design
      Requirements Document (DRD)
      [NASA-TH-82705]
                                                   p0140 B82-12446
    Analytic investigation of efficiency and performance limits in klystron amplifiers
       using multidimensional computer programs:
       multi-stage depressed collectors; and
       thermionic cathode life studies
                                                   p0148 N82-12553
    Performance of advanced chromium electrodes for
the NASA Redox Energy Storage System
[NASA-TM-82724] p0159 882-12
                                                  p0159 N82-12574
    End region and current consolidation effects
       upon the performance of an MHD channel for the
       ETF conceptual design
    [NASA-TM-82744] p0141 N82-12943
Test results and facility description for a
       40-kilowatt stirling engine
       [NASA-TM-82620]
                                                   p0141 N82-13013
    The effect of rotor blade thickness and surface
       finish on the performance of a small axial
       flow turbine
                                                   p0141 N82-13114
       [ NASA-TM-82726]
    Aluminum blade development for the Mod-OA 200-kilowatt wind turbine
[NASA-TM-82594] p0143 N8
NATIONAL ABRONAUTICS AND SPACE ADMINISTRATION.
MARSHALL SPACE FLIGHT CENTER, HUHTSVILLE, ALA.
Solar power satellite microwave power
                                                   p0143 N82-14633
       transmission and reception system
    p0145 A82-11743
Power management of multi-hundred kilowatt
       spacecraft power systems
                                                   p0046 A82-11769
    Satellite power system: Concept development and evaluation program. Volume 4: Energy conversion and power management [NASA-TM-58237-VOL-4] p0078 N82-1463 Satellite power system: Concept development and evaluation program. Volume 7: Space
                                                   p0078 N82-14634
       transportation
       [NASA-TM-58238-VOL-7]
                                                   p0078 N82-14635
BATIOBAL ABROBAUTICS AND SPACE ADMINISTRATION. PASADENA OFFICE, CALIP.
    Solar energy modulator [NASA-CASE-NFO-15388-1]
                                                   p0063 N82-10496
    Pluidized bed coal combustion reactor
                                                  p0097 N82-11144
       [NASA-CASE-NPO-14273-1]
    Hydrodesulfurization of chlorinated coal [NASA-CASE-NPO-15304-1] p0107
                                                   p0107 N82-12240
    Supercritical multicomponent solvent coal
       extraction
       [NASA-CASE-NPO-15767-1]
                                                   p0107 N82-12241
NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
    Mass spectrometric studies of MHD slag
       thermochemistry
       [PB81-221434]
                                                   p0138 N82-11173
    Energy analysis for a sample building by the
       proposed ASHRAE simplified method [DE81-027189]
                                                   p0012 N82-11323
    Passive/hybrid solar components:
                                                 An approach to
       standard thermal test methods
                                                   p0077 N82-13549
       [PB81-227886]
    Vaporization and chemical transport under coal
       gasification conditions
       [PB81-245839]
                                                   P0117 N82-15165
    Dimensions, volume 65, number 3 [PB81-235053]
                                                   p0161 N82-15436
NATIONAL HIGHWAY TRAPFIC SAFETY ADMINISTRATION,
WASHINGTON, D. C.
    Third automotive fuel economy research
      contractors coordination meeting [PB81-222754]
                                                  p0014 N82-11627
```

```
MATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION,
BOULDER, COLO.
    Environmental effects of pollutants from coal
      combustion. 2: The Colstrip, Montana Power
      Plant
      [ PB81-234114 ]
    Environmental assessment of the Alaskan
Continental Shelf: Annual reports of
principal investigators for the year ending
March 1980. Volume 5: Hazards
[PB81-225732] p0026 N82-
                                                 p0026 N82-13607
NATIONAL TELECOMMUNICATIONS AND INFORMATION
ADMINISTRATION, BOULDER, COLO.

Effects of the Satellite Power System on low
      Earth orbit and geosynchronous satellites
      [ PB81-232019 ]
                                                 p0150 N82-13157
NATIONALE BAAD VOOR LANDBOUWKUNDIG ONDERZOEK THO,
THE HAGUE (BETHERLANDS).
    Basis for research proposals concerning
      (industrial) solar energy production processes derived from biological principles
                                                p0075 N82-12640
WATURAL RESOURCES DEPENSE COUNCIL, INC., SAN
PRANCISCO, CALIP.
    Projecting regional potentials for
      cost-effective energy conservation and
      renewable resource applications: A
      feasibility study [DOE/CS-10045/T3]
[DOE/CS-10045/T3] p0027 N82-14645
NAVAL RESEARCH LAB., WASHINGTON, D. C.
An experimental study of SO3 dissociation as a
      mechanism for converting and transporting
      solar energy
                                                 p0043 A82-11214
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER,
ANNAPOLIS, MD.
    Outgassing of two synthetic fuels
      [AD-A104580]
                                                 p0100 N82-11231
NEVADA UNIV., RENO.
    Low-to-moderate temperature geothermal resource
      assessment for Nevada, area specific studies
      [DE81-030487]
                                                 p0096 N82-10475
NEW HAMPSHIRE UNIV., DURHAM.
    Liquefaction of bituminous coals using disposal
      ore catalysts and hydrogen [DE81-029134]
                                                p0093 N82-10154
    Fuels and chemicals made from solar energy
      [DB81-025018]
                                                p0077 N82-14384
NEW MEXICO STATE UNIV., LAS CRUCES.
    An experimental study of SO3 dissociation as a
      mechanism for converting and transporting
      solar energy
    Assessment of water supply contamination due to
      underground coal gasification
      [ PB81-209215 ]
                                                 D0021 N82-12680
MBW MEXICO UNIV., ALBUQUERQUE.
Assessment of water supply contamination due to
      underground coal gasification
      [ PB81-209215 ]
                                                 D0021 N82-12680
NEW YORK STATE EMERGY RESEARCH AND DEVELOPMENT
AUTHORITY, NEW YORK.
Low/medium-Btu coal-gasification assessment
      program for specific sites of two New York
      utilities
      [ DE81-025518 ]
                                                 p0101 N82-11240
NORTH CAROLINA UNIV., CHAPEL HILL.

Peat deposits of Dismal Swamp pocosins: Camden,
Currituck, Gates, Pasquotank, and Perguimans
Counties, North Carolina
      [DE81-029642]
                                                 D0109 N82-12524
HORTH DAKOTA UNIV., GRAND FORKS.
Chemistry of lignite liquefaction
[DE81-030178] p0093 N82-
NORTHERN RESOURCES, INC., BILLINGS, MONT.
Feasibility and economic study of medium-BTU
                                                p0093 N82-10249
      coal gas blended with high-BTU by product gas
      as an industrial energy source at Billings
      Montana
                                                p0101 N82-11237
      [ DE81-025166 ]
    Peasibility and economic study of medium-Btu
      coal gas blended with high-Btu by-product gas
      as an industrial energy source at Billings,
      Montana
      [ DE81-030622 ]
                                                p0107 #82-12254
MORTHWESTERN UNIV., RVANSTON, ILL.
Application of Bayesian analysis for wind energy
      site evaluation
                                                p0113 N82-13619
```

An interferometer-based phase control system	fluidized bed combustion
p0147 882-12547	[DE81-030629] p0117 N82-15222
A sonic satellite power system microwave power	Potential contribution of currently operating
transmission simulator	nuclear-fueled electric-generating units to
p0147 N82-12548	reducing US oil consumption
A theoretical study of microwave beam absorption by a rectenna	[DE81-030497] p0031 N82-15553 OAK RIDGE Y-12 PLANT, TENN.
p0149 N82-12563	Composite flywheel balance experience
, , , , , , , , , , , , , , , , , , , ,	[DE81-769341] p0157 N82-10549
· •	OCCIDENTAL RESEARCH CORP., IRVINE, CALIF.
U	Controlled-flash pyrolysis
OAK RIDGE ASSOCIATED UNIVERSITIES, TRBN.	[DE82-000284] p0111 N82-13196
Biomass energy systems: Descriptions and	OFFICE OF ENERGY RESOURCES, AUGUSTA, MAINE.
employment requirements for typical operations	Peat resource evaluation: State of Maine
[DE82-000236] p0113 N82-13538 Response of the oceans to increasing atmospheric	[DE82-000227] p0109 N82-12523 OHIO RIVER BASIN COMMISSION, CINCINNATI.
carbon dioxide	Coal liquefaction demonstration plant near
[DE81-028178] p0025 N82-13558	Morgantown, West Virginia; water assessment
Education and training implications of biomass	report section 13(b)
energy system use	[PB81-216095] p0103 N82-11269
[DB81-029956] p0028 N82-14664	Coal liquefaction demonstration plant near
OAK RIDGE NATIONAL LAB., TENN.	Morgantown, West Virginia: Water assessment
Ion exchange characteristics of enhanced oil	report
recovery systems (miscibility studies) [DB81-769734] pCC96 N82-10478	[PB81-216103] p0011 N82-11270 OKLAHOMA STATE UNIV., STILLWATER.
Annual cycle energy system	Plow aerodynamics modeling of an MHD swirl
[DE81-024911] p0007 N82-10552	combustor - Calculations and experimental
Water-related constraints to the development of	verification
geothermal electric generating stations	p0127 A82-12113
[DE81-025138] p0007 #82-10561	OKLAHOMA UBIV., NORMAN.
Environmental compliance program handbook	Development of a thermodynamic properties
[DE81-030226] p0008 N82-10585	correlation framework for the coal conversion
Tennessee Valley Authority atmospheric fluidized-bed combustor simulation	industry, phase 1A [DE81-030363] p0111 N82-12985
[DE81-030262] p0098 B82-11151	[DE81-030363] p0111 N82-12985 OLD MORTH MFG. CO., INC., LEMOIR, N.C.
Assessment of building diagnostics	SOL-CYCLE: A solar-assisted solvent-recycling
[DE81-027078] p0012 N82-11321	process for asphalt-impregnation of fiber board
Cycle and performance analysis of absorption	[DE81-903377] p0070 N82-11615
heat pumps for waste heat utilization	OPEN UNIV., MILTON (RUGLAND).
[DE81-030705] p0103 N82-11405	The nuclear controversy: Unequal competition in
Energy analysis of human ecosystems in an	public policy-making
Appalachian coal county	[BBG-035] p0027 N82-14626
[DB81-025177] p0013 N82-11574 Engineering challenges of fusion-reactor	OPTICAL COATING LAB., INC., CITY OF INDUSTRY, CALIF. Silicon solar cell process development,
development	fabrication and analysis
[DE81-024129] p0139 M82-11907	[NASA-CR-163787] p0063 N82-10500
Selective separation of coal feedstocks for	OREGON STATE UNIV., CORVALLIS.
conversion by magnetic separation techniques	Network wind power over the Pacific northwest.
[DE81-028060] p0108 B82-12263	Appendix 1: Wind statistics summaries for the
Measurement of thermal conductivities in coal	wind power data stations
fluids [DB82-000523] p0109 N82-12400	[DB81-029291] p0112 N82-13518
[DE82-000523] p0109 N82-12400 Seasonal performance factors for active solar	Wind Power: Research on network wind power over the Pacific northwest. Executive summary
systems and heat-pump systems	[DE81-029360] p0142 N82-13519
[DE81-028569] p0074 M82-12625	[Free and the second
Kinetics of wet oxidation of biological sludges	P
from coal-conversion wastewater treatment	F
[DB82-000525] p0021 N82-12674	PACIFIC WORTHWEST LAB., RICHLAND, WASH.
Overview of the biomedical and environmental	Review of simulation techniques for Aquifer
programs at the Oak Ridge National Laboratory	Thermal Energy Storage (ATES)
[DE81-027864] p0021 N82-12765 Low-level radioactive waste: An introductory	[DE81-029943] p0156 N82-10532 Analysis of data from the US Department of
Overview	Energy's meteorological validation program
V.V	200131
[DB81-026334] p0022 N82-12924	[DB81-030100] p0097 N82-10655
[DB81-026334] p0022 M82-12924 H-Coal product physical properties measurement	[DB81-030100] p0097 N82-10655 Technology assessment of solar energy systems:
H-Coal product physical properties measurement [DE81-029095] p0111 H82-13245 Annual cycle energy system experimental	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest
H-Coal product physical properties measurement `[DR81-029095] Annual cycle energy system experimental performance and national applicability	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535
H-Coal product physical properties measurement [Pubble 1-029095] Annual cycle energy system experimental performance and national applicability [DE81-028570] p0024 N82-13523	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] Treatment of biomass gasification wastewaters
H-Coal product physical properties measurement [INTERPLICATION NO. 1	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis
H-Coal product physical properties measurement [DE81-029095] p0111 M82-13245 Annual cycle energy system experimental performance and national applicability [DE81-028570] p0024 M82-13523 Building a consensus about energy technologies [DE82-000501] p0024 M82-13536	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566
H-Coal product physical properties measurement [DR81-029095] Annual cycle energy system experimental performance and national applicability [DR81-028570] Building a consensus about energy technologies [DR82-000501] P0024 M82-13536 Control of hydrocarbons and carbon monoxide via	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by
H-Coal product physical properties measurement [DE81-029095] Annual cycle energy system experimental performance and national applicability [DE81-028570] Building a consensus about energy technologies [DE82-000501] p0024 B82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation
H-Coal product physical properties measurement [DR81-029095] Annual cycle energy system experimental performance and national applicability [DR81-028570] Building a consensus about energy technologies [DR82-000501] P0024 M82-13536 Control of hydrocarbons and carbon monoxide via	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by
H-Coal product physical properties measurement [DR81-029095] Annual cycle energy system experimental performance and national applicability [DE81-028570] Building a consensus about energy technologies [DB82-000501] P0024 M82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration [DR82-000508] Health and safety research division [DE81-026088] P0026 M82-13652	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627
H-Coal product physical properties measurement [DR81-029095] p0111 M82-13245 Annual cycle energy system experimental performance and national applicability [DB81-028570] p0024 M82-13523 Building a consensus about energy technologies [DB82-000501] p0024 M82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration [DB82-000508] p0025 M82-13560 Health and safety research division [DB81-026088] p0026 M82-13652 Coal conversion solid waste disposal	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627 Technology change and energy consumption: A
H-Coal product physical properties measurement [DB81-029095] p0111 N82-13245 Annual cycle energy system experimental performance and national applicability [DB81-028570] p0024 N82-13523 Building a consensus about energy technologies [DB82-000501] p0024 N82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration [DB82-000508] p0025 N82-13560 Health and safety research division [DB81-026088] p0026 N82-13652 Coal conversion solid waste disposal [DB81-028567] p0116 N82-14680	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627 Technology change and energy consumption: A comparison of residential subdivisions
H-Coal product physical properties measurement [DR81-02995] Annual cycle energy system experimental performance and national applicability [DR81-028570] Building a consensus about energy technologies [DR82-000501] Control of hydrocarbons and carbon monoxide via catalytic incineration [DR82-000508] Bealth and safety research division [DR81-026088] Coal conversion solid waste disposal [DR81-028567] Thermolysis of naphthols	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627 Technology change and energy consumption: A comparison of residential subdivisions [DE81-030075] p0031 N82-15555
H-Coal product physical properties measurement [DR81-029095] Annual cycle energy system experimental performance and national applicability [DR81-028570] Building a consensus about energy technologies [DR82-000501] P0024 M82-13523 Building a consensus about energy technologies [DR82-000501] P0024 M82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration [DR82-000508] P0025 M82-13560 Health and safety research division [DR81-026088] Coal conversion solid waste disposal [DR81-028567] Thermolysis of naphthols [DR81-029684] P0116 M82-15152	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627 Technology change and energy consumption: A comparison of residential subdivisions [DE81-030075] p0031 N82-15555 Wind speed simulation for economic evaluation of
H-Coal product physical properties measurement [DR81-029095] p0111 M82-13245 Annual cycle energy system experimental performance and national applicability [DB81-028570] p0024 M82-13523 Building a consensus about energy technologies [DB82-000501] p0024 M82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration [DB82-000508] p0025 M82-13560 Health and safety research division [DB81-026088] p0026 M82-13652 Coal conversion solid waste disposal [DB81-028567] p0116 B82-14680 Thermolysis of naphthols [DB81-029684] p0116 B82-15152 US ceramic heat exchanger technology: Status	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627 Technology change and energy consumption: A comparison of residential subdivisions [DE81-030075] Wind speed simulation for economic evaluation of wind energy conversion systems
H-Coal product physical properties measurement [DB81-029095] p0111 M82-13245 Annual cycle energy system experimental performance and national applicability [DB81-028570] p0024 M82-13523 Building a consensus about energy technologies [DB82-000501] p0024 M82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration [DB82-000508] p0025 M82-13560 Health and safety research division [DB81-026088] p0026 M82-13652 Coal conversion solid waste disposal [DB81-028567] p0116 B82-14680 Thermolysis of naphthols [DB81-029684] p0116 B82-15152 US ceramic heat exchanger technology: Status and opportunities	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627 Technology change and energy consumption: A comparison of residential subdivisions [DE81-030075] p0031 N82-15555 Wind speed simulation for economic evaluation of wind energy conversion systems [DE81-030077] p0119 N82-15560
H-Coal product physical properties measurement [DR81-029095] p0111 M82-13245 Annual cycle energy system experimental performance and national applicability [DB81-028570] p0024 M82-13523 Building a consensus about energy technologies [DB82-000501] p0024 M82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration [DB82-000508] p0025 M82-13560 Health and safety research division [DB81-026088] p0026 M82-13652 Coal conversion solid waste disposal [DB81-028567] p0116 B82-14680 Thermolysis of naphthols [DB81-029684] p0116 B82-15152 US ceramic heat exchanger technology: Status	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627 Technology change and energy consumption: A comparison of residential subdivisions [DE81-030075] Wind speed simulation for economic evaluation of wind energy conversion systems
H-Coal product physical properties measurement [DR81-029095] Annual cycle energy system experimental performance and national applicability [DR81-028570] Building a consensus about energy technologies [DR82-000501] P0024 M82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration [DR82-000508] P0025 M82-13560 Health and safety research division [DR81-026088] P0026 M82-13652 Coal conversion solid waste disposal [DR81-028567] Thermolysis of naphthols [DR81-029684] D0116 R82-15152 US ceramic heat exchanger technology: Status and opportunities [DR81-029686] Pailure modes and effects analysis of a coal-slurry preheater	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627 Technology change and energy consumption: A comparison of residential subdivisions [DE81-030075] p0031 N82-15555 Wind speed simulation for economic evaluation of wind energy conversion systems [DE81-030077] p0119 N82-15560 Assessment of the long-range transport of
H-Coal product physical properties measurement [DR81-029095] p0111 M82-13245 Annual cycle energy system experimental performance and national applicability [DE81-028570] p0024 M82-13523 Building a consensus about energy technologies [DB82-000501] p0024 M82-13536 Control of hydrocarbons and carbon monoxide via catalytic incineration [DR82-000508] p0025 M82-13560 Health and safety research division [DE81-026088] p0026 M82-13652 Coal conversion solid waste disposal [DB81-028567] p0116 M82-14680 Thermolysis of naphthols [DE81-029684] p0116 M82-15152 US ceramic heat exchanger technology: Status and opportunities [DE81-029686] p0030 M82-15210 Failure modes and effects analysis of a	Technology assessment of solar energy systems: Availability and impacts of woody biomass utilization in the Pacific Northwest [DE82-000705] p0024 N82-13535 Treatment of biomass gasification wastewaters using reverse osmosis [DE82-000698] p0025 N82-13566 Treatment of biomass-gasification wastewaters by wet-air oxidation [DE82-000935] p0025 N82-13567 Numerical wind-speed simulation model [DE82-000956] p0113 N82-13627 Technology change and energy consumption: A comparison of residential subdivisions [DE81-030075] p0031 N82-15555 Wind speed simulation for economic evaluation of wind energy conversion systems [DE81-030077] Assessment of the long-range transport of residential woodstove fine-particulate

p0158 N82-11621

p0140 N82-12572

p0137 N82-10494

p0105 N82-11588

p0080 N82-15534

p0032 N82-15596

p0115 N82-14385

p0115 N82-14386

p0028 N82-14648

p0140 N82-11993

p0146 A82-17982

p0148 N82-12554

p0148 N82-12558

p0149 N82-12560

p0068 N82-11557

p0068 #82-11558

. p0008 N82-10573

p0071 N82-11625

p0149 N82-12562

[DE81-030673]

```
PAU DELV. (PRANCE).
                                                                                              Preliminary design study of underground pumped
hydro and compressed-air energy storage in
hard rock. Volume 9: Design approaches:
    Microemulsions, emulsions and related systems:
        Energy applications
                                                                                                 CAES, appendix C. Major mechanical equipment [DE81-030672] p0158 N82-11
                                                        p0113 N82-13545
PEDCO-ENVIRONMENTAL, INC., CINCINNATI, OHIO.
EPA utility PGD (Flue Gas Desulfurization)
[PB81-225773] p0015 N
                                                                                          PRATT AND WHITNEY AIRCRAPT GROUP, BAST HARTPORD,
                                                                    survey
                                                        p0015 N82-11679
                                                                                          CONN.
    PGDIS primer: Major equipment/component
                                                                                              Low NO sub x heavy fuel combustor concept program
       classifications, problem/solution access codes, and definitions related to PGD systems
                                                                                                 [ NASA-CR-165512]
                                                                                          PRINCETON DRIV., N. J.
        as contained in the Flue Gas Desulfurization
                                                                                              The plasmadynamics and ionization kinetics of
Information System (FGDIS)
[PB81-225948]

PENHSYLVANIA STATE UNIV., UNIVERSITY PARK.
Controlled cadalum telluride thin films for
                                                                                                 thermionic energy conversion
                                                                                              Is geothermal simulation a catastrophe?
                                                                                          [DE81-026750] p0105 N82
PRINS HAURITS LAB. TNO, RIJSWIJK (NETHERLANDS).
       solar-cell applications [DE81-023275]
                                                                                              Solar power systems smaller than 500 W for military use
                                                         p0066 N82-10569
[DE81-0232/5] PUTOO NO2-10
PETRO-LEWIS CORP., DENVER, CCLO.
Field demonstration of the conventional steam
drive process with ancillary materials
[DE81-026849] PO115 N82-14
PHYSICAL SCIENCES, INC., WOBURN, MASS.
Synthetic-fuel combustion; pollutant formation.
                                                                                                 [ FML-1980-06]
                                                                                               Pollution of the soil by aviation gasoline
                                                                                                 [PBL-1979-41]
                                                        p0115 882-14522
                                                                                          PROTOTECH, INC., BENTON HIGHLANDS, MASS.
                                                                                              Energy savings by means of fuel-cell electrodes
                                                                                          in electro-chemical industries
[DE81-030975] p0018 N8
PUBLIC SERVICE CO. OF INDIANA, PLAINFIELD.
Compressed air energy storage: Preliminary
        Soot-initiation mechanisms in burning aromatics [DE81-029480] pC093 N82-10155
    [DR81-029480] pc093 1
Pulverized-fuel combustion: Modeling and
        scaleup methodologies
        [DE81-026546]
                                                                                                 design and site development program in an
PITTSBURG AND MIDWAY COAL MINING CO., ENGLEWOOD,
                                                                                                  aguifer. Volume 2: Utility system planning [DB82-000466] p0159 N82-13544
                                                                                          [DE82-000466] p0159 N82-1.
PUNJAB AGRICULTURE UNIV., LUDHIANA (INDIA).
Energy balance and utilization of agricultural
COLO.
     Solvent-Refined Coal (SRC) process
[DE81-031937] p
PITTSBURG EMERGY TECHNOLOGY CENTER, PA.
                                                         p0106 N82-12197
                                                                                                  waste on a farm
     Scot formation in synfuels
                                                                                                  [ PB81-229262 ]
        [DE81-030273]
                                                         p0099 N82-11164
                                                                                               Studies on sugarcane as an energy crop for Punjab
                                                                                          [PB81-232308]
PURDUE UNIV., LAPAYETTE, IND.
     Transport characteristics of alternate slurry
        fuels
     p0146 M82-11255
Synthesis gas conversion to liquid fuels using
promoted fused iron catalysts
[DE81-0308571
                                                                                              Security assessment of power systems including energy storage and with the integration of
                                                                                                 wind energy
[DE81-030166]
                                                                                              [DE81-030166] p0140 N82-12590 Application of a gravity-driven wickless heat.
        [DE81-030857]
PITTSBURG UNIV., PA.
Well-water-source heat pump field performance
                                                                                                 pipe for ice production in a cold energy
                                                                                                  storage system
        study
        [DE81-024136]
                                                         p0012 N82-11419
     Water and energy usage in coal preparation
                                                                                               Progress report to the Department of Energy in
        [PB81-238248]
                                                         p0112 N82-13486
                                                                                               support of basic energy and policy research
POLYTECHNIC INST. OF NEW YORK, FARMINGDALB.
One-dimensional equilibrium-chemistry flow model
                                                                                                 [DE81-025882]
        for coal combustors
                                                                                                                                R
       [DE81-027622]
                                                         p0099 N82-11158
POPE, EVANS, AND ROBBINS, INC., NEW YORK.
Evaluation of coal gasification/combined cycle
                                                                                          RASOR ASSOCIATES, INC., SUMMYVALE, CALIF.

Jet impingement heat transfer enhancement for
        power plant feasibility at the Sewells Point Baval Complex, Norfolk, Virginia
                                                                                                 the GPU-3 Stirling engine
                                                                                                 [ NASA-TM-82727]
[AD-A103674] p0116 N82-14639
POTOHAC ELECTRIC POWER CO., WASHINGTON, D.C.
Preliminary design study of underground pumped hydro and compressed-air energy storage in
                                                                                          RAYTHEON CO., WALTHAM, MASS.
Status of the microwave power transmission components for the solar power satellite
                                                                                              The adapting of the crossed-field directional amplifier to the requirements of the SPS
        hard rock.
                         Volume 1: Executive summary
        [DE81-029440]
                                                        p0155 N82-10527
     Preliminary design study of underground pumped
hydro and compressed-air energy storage in
hard rock. Volume 2: Project design
                                                                                               Method for precision forming of low-cost,
        hard rock. Vo. criteria: UPH
                                                                                                  thin-walled slotted waveguide arrays for the SPS
        [DE81-028107]
                                                         p0156 N82-10528
                                                                                               The history of the development of the rectenna
     Preliminary design study of underground pumped
hydro and compressed-air energy storage in
                                                                                          RCA LABS., PRIBCETON, N. J.
Amorphous boron-silicon-hydrogen alloys for.
        hard rock.
                         Volume 5: Site selection
        [DE81-028199]
                                                        p0156 N82-10529
                                                                                                  thin-film heterojunction solar cells
     Preliminary design study of underground pumped
                                                                                                 [DE81-027234]
        hydro and compressed-air energy storage in
hard rock. Volume 9: Design approaches,
CAES. Appendix D: Mechanical systems
                                                                                               Amorphous boron-silicon-hydrogen alloys for
                                                                                                  thin-film heterojunction solar cells
                                                                                          [DB81-027254]
RENAULT VEHICLES INDUSTRIELS (PRANCE).
        [DE81-028200]
                                                        p0156 N82-10530
     Preliminary design study of underground pumped
                                                                                               Energy consumption and heavy-duty vehicles
       hydro and compressed-air energy storage in
hard rock. Volume 3: Froject design
criteria: CAES
                                                                                          REMSSELAER POLYTECHNIC INST., TROY, N. Y.
                                                                                               The Rogers focusing heliostat experimental
        [DB81-028197]
                                                         p0156 N82-10546
                                                                                                 program at Rensselaer Polytechnic Institute
    [DE81-02819/]
Preliminary design study of underground pumped hydro and compressed-air energy storage in hard rock. Volume 12: Plant design, CAES [DE81-028110] p0157 N82-10574
                                                                                                  [ PB81-226813 ]
                                                                                               Rectenna session: Micro aspects
                                                                                          RESEARCH TRIANGLE INST., RESEARCH TRIANGLE PARK, N. C.
     Preliminary design study of underground pumped
hydro and compressed-air energy storage in
hard rock. Volume 8: Lesign approaches: UPH
                                                                                              Coal gasifier parameters influencing environmental pollutant production
```

p0158 N82-11620

[PB81-221301]

Vapor-phase cracking and wet oxidation as	Intermediate photovoltaic-system application
potential pollutant control techniques for	experiment operational performance report.
coal gasification	Volume 1: For Lovington Square Shopping
[PB81-219594] p0015 B82-11661 Environmental hazard rankings of pollutants	Center site, Lovington, New Mexico [DE81-028971] p0065 N82-10543
generated in coal gasification processes	Solar photovoltaic system engineering perspectives
[PB81-231698] p0026 N82-13576	[DE81-023179] p0066 N82-10570
Symposium proceedings: Environmental aspects of	Automated Fresnel lens tester system
fuel conversion technology, 5th	[DB81-029483] p0066 N82-10863
[PB81-245045] p0034 #82-15623 Proceedings: Symposium on Flue Gas	Wind ripple analysis [DE81-030129] p0138 N82-11044
Desulfurization, volume 1	Performance testing of the TOLTEC TI-410
[PB81-243156] p0035 N82-15651	concentrating solar collector
Proceedings: Symposium on Plue Gas	[DE81-029994] p0071 N82-11617
Desulfurization, volume 2	Vertical-axis wind-turbine control strategy
[PB81-243164] p0035 N82-15652	[DE81-031932] p0141 N82-12591 Comparative economics of solar thermal central
Planning a comprehensive program for exploration	receivers
of the anthracite deposits of the Marragansett	[DE81-029623] p0072 N82-12601
Basin of Massachusetts and Rhode Island, phase	User's guide to HELIOS: A computer program for
1 and 2	modeling the optical behavior of reflecting
[DE81-028490] p0104 N82-11519	solar concentrators. Part 1: Introduction
RICARDO & CO., BUGINEERS (1927) LTD.,	and code input [pE81-031920] p0073 N82-12616
SHOREHAM-BY-SEA (EMGLAND). The utilisation of alcohol in light duty diesel	[DE81-031920] p0073 N82-12616 Department of Energy Solar Central Receiver
engines	Semiannual Meeting
[PB81-244469] p0118 N82-15452	[SAND-80-8049] p0074 N82-12632
RICE UNIV., HOUSTON, TEX.	Geothermal-resource verification for Air Force
Direct conversion of light to radio frequency	Bases
energy ,	[DB81-027482] p0112 882-13520
P0045 A82-11712 ROCKET RESEARCH CORP., REDMOND, WASH.	Intermediate photovoltaic system application experiment operational performance report.
Utilization of waste heat from major transformer	Volume 2 for Beverly High School, Beverly, Mass.
substations. Volume 1: Generic study	[DE82-000811] p0077 N82-13532
[DE81-904212] p0019 N82-12593	Catalytic effect of iron in hydrogasification of
Otilization of waste heat from major transformer	coal
substations. Volume 2: Site-specific study	[DE81-023928] p0113 N82-14323
[DE81-904236] p0019 H82-12594 ROCKWELL INTERNATIONAL CORP., CANOGA PARK, CALIF.	Accessing the geothermal resources [DE81-025396] p0116 N82-14614
Molten-salt coal-gasification process	Sandia program in geothermal technology
development unit, phase 2	development
[DE81-023585] p0094 N82-10251	[DE81-025394] p0119 N82-15546
ROCKWELL INTERNATIONAL CORP., PITTSBURGE, PA.	Project DEEP STEAM: Fourth meeting of the
Ionospheric effects in active retrodirective	technical advisory panel
array and mitigating system design	[DE81-029457] p0144 #82-15561
array and mitigating system design p0147 N82-12551	[DE81-029457] p0144 #82-15561 SABDIA LABS., LIVERHORE, CALIP.
array and mitigating system design	[DE81-029457] p0144 #82-15561
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts	[DE81-029457] p0144 #82-15561 SANDIA LABS., LIVERMOBE, CALIP. Second generation heliostat, volume 1 [DE81-029618] p0069 #82-11564 Study of photovoltaic cost elements. Volume 1:
array and mitigating system design p0147 N82-12551 The Resonant Cavity Badiator (BCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar	[DE81-029457] p0144 #82-15561 SABDIA LABS., LIVERMORE, CALIP. Second generation heliostat, volume 1 [DE81-029618] p0069 #82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite	[DE81-029457] p0144 882-15561 SANDIA LABS., LIVERMORE, CALIP. Second generation heliostat, volume 1 [DE81-029618] p0069 882-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 882-11566
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIP. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3:
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite	[DE81-029457] p0144 882-15561 SANDIA LABS., LIVERMORE, CALIP. Second generation heliostat, volume 1 [DE81-029618] p0069 882-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 882-11566
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIP. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4:
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMOBE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO.	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIP. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIP. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 BOSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 BOYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Pian for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985:	[DE81-029457] p0144 #82-15561 SANDIA LABS., LIVERMORE, CALIP. Second generation heliostat, volume 1 [DE81-029618] p0069 #82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 #82-11566 Study of photovoltaic cost elements. Volume 3: Sandia Mational Laboratories photovoltaic systems design catalog [DE81-030986] p0069 #82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. pevelopment of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2.	[DE81-029457] p0144 #82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 #82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 #82-11566 Study of photovoltaic cost elements. Volume 3: Sandia Mational Laboratories photovoltaic systems design catalog [DE81-030986] p0069 #82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 #82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technolcal challenges. 2. Besearch requirements. 3. High priority	[DE81-029457] p0144 #82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 #82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 #82-11566 Study of photovoltaic cost elements. Volume 3: Sandia Mational Laboratories photovoltaic systems design catalog [DE81-030986] p0069 #82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 #82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 #82-11569
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs	[DE81-029457] p0144 882-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 882-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 882-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 882-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 882-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 882-11569 Design, cost and performance comparisons of
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORWEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Bessearch requirements. 3. High priority programs [DE81-904014] p0104 N82-11520	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMOBE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 N82-11569 Design, cost and performance comparisons of several solar thermal systems for process
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs	[DE81-029457] p0144 882-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 882-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 882-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 882-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 882-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 882-11569 Design, cost and performance comparisons of
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 N82-11520 RUHRCHEMIE A.G., OBERHAUSEM (WEST GERMAN). Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205	[DE81-029457] p0144 882-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 882-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 882-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 882-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 882-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 882-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive sumary [DE81-029881] p0069 882-11576
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORWEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] RUBRCHEMIE A.G., OBERHAUSEH (WEST GERMANY). Thermal processing of used catalysts [BHFT-FB-T-80-189] p0016 N82-12205 RUBRCHEMOLE A.G., BSSEN (WEST GERMANY).	[DE81-029457] p0144 #82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 #82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 #82-11566 Study of photovoltaic cost elements. Volume 3: Sandia Mational Laboratories photovoltaic systems design catalog [DE81-030986] p0069 #82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 #82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 #82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 #82-11576 Solar thermal central receivers for industrial process heat generation: User views and
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 N82-11520 RUBRCHERHER A.G., OBERRAUSEN (WEST GERMANY). Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 RUHRKOHLE A.G., RSSEN (WEST GERMANY). Safety and technical optimization of belt	[DE81-029457] p0144 M82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 M82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 M82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 M82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 M82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 M82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 M82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] RUBRCHENIE A.G., OBERHAUSEN (WEST GERMANY). Thermal processing of used catalysts [BHFT-FB-T-80-189] RUHRKOHLE A.G., ESSEN (WEST GERMANY). Safety and technical optimization of belt transfer points with special consideration for	[DE81-029457] p0144 882-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 882-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 882-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 882-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 882-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 882-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 882-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 882-12618
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 N82-11520 RUBRCHERHER A.G., OBERRAUSEN (WEST GERMANY). Thermal processing of used catalysts [BMFT-FB-T-80-189] p0016 N82-12205 RUHRKOHLE A.G., RSSEN (WEST GERMANY). Safety and technical optimization of belt	[DE81-029457] p0144 M82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 M82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 M82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 M82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 M82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 M82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 M82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORMEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] RUHRCHEMIE A.G., OBERHAUSEM (WEST GERMAN). Thermal processing of used catalysts [BMFT-FB-T-80-189] RUHRKOHLE A.G., RESEM (WEST GERMAN). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts	[DE81-029457] p0144 M82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 M82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 M82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 M82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 M82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 M82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 M82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 M82-12618 Solar-central-receiver fuels and chemicals [DE82-000941] p0077 M82-13530 SCIEBCE APPLICATIONS, IEC., LA JOLLA, CALIF.
The Resonant Cavity Radiator (RCR) P0148 W82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite P0149 W82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 W82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 W82-11520 RUHRCHENIE A.G., OBERRAUSEN (WEST GERMANY). Thermal processing of used catalysts [BMFT-FB-T-80-189] RUHRKOHLE A.G., RSSEN (WEST GERMANY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BMFT-FB-HA-80-048] p0096 W82-10279	[DE81-029457] p0144 882-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 882-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 882-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 882-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 882-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 882-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 882-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 882-12618 Solar-central-receiver fuels and chemicals [DE82-000941] SCIEBCE APPLICATIONS, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat
array and mitigating system design p0147 N82-12551 The Resonant Cavity Radiator (RCR) p0148 N82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite p0149 N82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORWEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 N82-11520 RUBRCHEMIE A.G., OBERHAUSEH (WEST GERMANY). Thermal processing of used catalysts [BHFT-FB-T-80-189] p0016 N82-12205 RUHRKOHLE A.G., ESSEN (WEST GERMANY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BMFT-FB-HA-80-048] p0096 N82-10279	[DE81-029457] p0144 M82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 M82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 M82-11566 Study of photovoltaic cost elements. Volume 3: Sandia Mational Laboratories photovoltaic systems design catalog [DE81-030986] p0069 M82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 M82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-03981] p0069 M82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 M82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 M82-12618 Solar-central-receiver fuels and chemicals [DE82-000941] SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat Pump Efficiency) program
The Resonant Cavity Radiator (RCR) P0148 H82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite P0149 H82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 N82-11520 RUHRCHEMIE A.G., OBERHAUSEM (WEST GERHAMY). Thermal processing of used catalysts [BMFT-FB-T-80-189] RUHRKOHLE A.G., ESSEN (WEST GERHAMY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BMFT-FB-HA-80-048] p0096 N82-10279 SAMDIA LABS., ALBUQUEEQUE, B. MEK.	[DE81-029457] p0144 M82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 M82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 M82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 M82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 M82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 M82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 M82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 M82-12618 Solar-central-receiver fuels and chemicals [DE82-000941] p0077 M82-13530 SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat Pump Efficiency) program [DE81-769452] p0007 M82-10551
The Resonant Cavity Radiator (RCR) 10148 M82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite 10149 M82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. 1020 Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. 1121 Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 N82-11520 RUHRCHERHIE A.G., OBERHAUSEN (WEST GERMANY). Thermal processing of used catalysts [BHTT-FB-T-80-189] p0016 N82-12205 RUHRKOHLE A.G., ESSEN (WEST GERMANY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BHTT-FB-HA-80-048] p0096 N82-10279 SANDIA LABS., ALBUQUEEQUE, N. MEK. Residual stresses in darrieus vertical axis wind	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 N82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 N82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 N82-12618 Solar-central-receiver fuels and chemicals [DE82-00941] p0077 N82-13530 SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat Pump Efficiency) program [DE81-769452] p0007 N82-10551 SCIENCE APPLICATIONS, INC., ECLERE, VA.
The Resonant Cavity Radiator (RCR) P0148 H82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite P0149 H82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 N82-11520 RUHRCHEMIE A.G., OBERHAUSEM (WEST GERHAMY). Thermal processing of used catalysts [BMFT-FB-T-80-189] RUHRKOHLE A.G., ESSEN (WEST GERHAMY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BMFT-FB-HA-80-048] p0096 N82-10279 SAMDIA LABS., ALBUQUEEQUE, B. MEK.	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 N82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 N82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 N82-12618 Solar-central-receiver fuels and chemicals [DE82-000941] p0077 N82-13530 SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat Pump Efficiency) program [DE81-769452] p0007 N82-10551
The Resonant Cavity Radiator (RCR) 10148 M82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite 10149 M82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIP. 1020 Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 N82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. 1121 Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 N82-11520 RUHRCHERHIE A.G., OBERRAUSEN (WEST GERMANY). Thermal processing of used catalysts [BMFT-FB-T-80-189] BUHRKOHLE A.G., RSSEN (WEST GERMANY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BMFT-FB-HA-80-048] p0096 N82-10279 SANDIA LABS., Albuquerque, N. Mex. Residual stresses in darrieus vertical axis wind turbine blades [DE81-1026144] p0136 N82-10434 Frequency response analysis of fluid control	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 N82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 N82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 N82-12618 Solar-central-receiver fuels and chemicals [DE82-000941] p0077 N82-13530 SCIEBCE APPLICATIOES, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat Pump Efficiency) program [DE81-769452] p0007 N82-10551 SCIEBCE APPLICATIONS, INC., HCLEAH, VA. Technical and economic assessment of solar thermophotovoltaic conversion [DE81-803762] p0064 N82-10515
The Resonant Cavity Radiator (RCR) P0148 M82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite P0149 M82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] p0078 M82-14630 ROYAL HORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] p0104 M82-11520 RUHRCHEMIE A.G., OBERHAUSEM (WEST GERMANY). Thermal processing of used catalysts [BHTT-FB-T-80-189] p0016 M82-12205 RUHRKOHLE A.G., RESEM (WEST GERMANY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BHFT-FB-HA-80-048] p0096 M82-10279 SANDIA LABS., ALBUQUEEQUE, N. MEN. Residual stresses in darrieus vertical axis wind turbine blades [DE81-1026144] Frequency response analysis of fluid control systems for parabolic-trough solar collectors	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 N82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 N82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 N82-12618 Solar-central-receiver fuels and chemicals [DE82-000941] p0077 N82-13530 SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat Pump Efficiency) program [DE81-69452] p0007 N82-10551 SCIENCE APPLICATIONS, INC., MCLERN, VA. Technical and economic assessment of solar thermophotovoltaic conversion [DE81-803762] p0064 N82-10515 Parametric sensitivity study for solar-assisted
The Resonant Cavity Radiator (RCR) P0148 M82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite P0149 M82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] ROYAL MORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] RUHRCHERIE A.G., OBERRAUSEN (WEST GERMANY). Thermal processing of used catalysts [BMFT-FB-T-80-189] RUHRKOHLE A.G., ESSEN (WEST GERMANY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BMFT-FB-HA-80-048] P0136 N82-10279 SANDIA LABS., ALBUQUERQUE, N. MEN. Residual stresses in darrieus vertical axis wind turbine blades [DE81-1026144] Frequency response analysis of fluid control systems for parabolic-trough solar collectors [DE81-029293] P0064 N82-10513	[DE81-029457] p0144 M82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 M82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 M82-11566 Study of photovoltaic cost elements. Volume 3: Sandia Mational Laboratories photovoltaic systems design catalog [DE81-030986] p0069 M82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 M82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-03981] p0069 M82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 M82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 M82-12618 Solar-central-receiver fuels and chemicals [DE82-000941] SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat Pump Efficiency) program [DE81-769452] SCIENCE APPLICATIONS, INC., MCLEAN, VA. Technical and economic assessment of solar thermophotovoltaic conversion [DE81-803762] p0064 M82-10515 Parametric sensitivity study for solar-assisted heat-pump systems
The Resonant Cavity Radiator (RCR) P0148 M82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite P049 M82-12568 ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] ROYAL MORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] RUHRCHEMIE A.G., OBERHAUSEN (WEST GERMANY). Thermal processing of used catalysts [BMFT-FB-T-80-189] RUHRKOBLE A.G., RESEN (WEST GERMANY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BMFT-FB-HA-80-048] P0136 M82-10279 SANDIA LABS., ALBUQUERQUE, N. MEN. Residual stresses in darrieus vertical axis wind turbine blades [DE81-029293] P0136 M82-10434 Frequency response analysis of fluid control systems for parabolic-trough solar collectors [DE81-029293] Solar energy system design: A simple method for	[DE81-029457] p0144 M82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 M82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 M82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 M82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 M82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-030981] p0069 M82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-030981] p0069 M82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 M82-12618 Solar-central-receiver fuels and chemicals [DE82-000941] p0077 M82-13530 SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat Pump Efficiency) program [DE81-769452] p0007 M82-10551 SCIENCE APPLICATIONS, INC., MCLEAN, VA. Technical and economic assessment of solar thermophotovoltaic conversion [DE81-803762] Parametric sensitivity study for solar-assisted heat-pump systems [DE81-030309] p0067 M82-11407
The Resonant Cavity Radiator (RCR) P0148 M82-12556 Solid-state retrodirective phased array concepts for microwave power transmission from Solar Power Satellite P0149 M82-12568 ROSS (BERND) ASSOCIATES, SAN DIRGO, CALIF. Development of an all-metal thick film cost effective metallization system for solar cells [NASA-CR-165043] ROYAL MORNEGIAM COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, OSLO. Plan for technological research and development related to the petroleum activities on the Norwegian Continental Shelf. 1981-1985: Appendixes: 1. Technical challenges. 2. Research requirements. 3. High priority programs [DE81-904014] RUHRCHERIE A.G., OBERRAUSEN (WEST GERMANY). Thermal processing of used catalysts [BMFT-FB-T-80-189] RUHRKOHLE A.G., ESSEN (WEST GERMANY). Safety and technical optimization of belt transfer points with special consideration for the suppression of noxious and explosive dusts [BMFT-FB-HA-80-048] P0136 N82-10279 SANDIA LABS., ALBUQUERQUE, N. MEN. Residual stresses in darrieus vertical axis wind turbine blades [DE81-1026144] Frequency response analysis of fluid control systems for parabolic-trough solar collectors [DE81-029293] P0064 N82-10513	[DE81-029457] p0144 N82-15561 SANDIA LABS., LIVERMORE, CALIF. Second generation heliostat, volume 1 [DE81-029618] p0069 N82-11564 Study of photovoltaic cost elements. Volume 1: Executive report. Volume 2: Project background [DE81-030982] p0069 N82-11566 Study of photovoltaic cost elements. Volume 3: Sandia National Laboratories photovoltaic systems design catalog [DE81-030986] p0069 N82-11567 Study of photovoltaic cost elements. Volume 4: Installation cost model for residential PV systems: Users manual [DE81-031921] p0069 N82-11568 Study of photovoltaic cost elements. Volume 5: Installation cost model for intermediate PV systems: Users manual [DE81-03981] p0069 N82-11569 Design, cost and performance comparisons of several solar thermal systems for process heat. Volume 1: Executive summary [DE81-029881] p0069 N82-11576 Solar thermal central receivers for industrial process heat generation: User views and recommendations for commercialization [DE81-029611] p0073 N82-12618 Solar-central-receiver fuels and chemicals [DE82-000941] SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF. Programmer's manual for the DOEHPE (DOE Heat Pump Efficiency) program [DE81-769452] SCIENCE APPLICATIONS, INC., MCLEAN, VA. Technical and economic assessment of solar thermophotovoltaic conversion [DE81-803762] p0064 N82-10515 Parametric sensitivity study for solar-assisted heat-pump systems

```
SYSTEMS CONTROL, INC., WEST PALM BEACH, FLA.
Analysis of integrated fuel-efficient, low-noise
      Peasibility analysis of trench strip and auger
          mining
          [DE81-027557]
                                                                                                                              procedures in terminal-area operations
                                                                          P0017 N82-12521
SMITE (WILBUR) AND ASSOCIATES, BEW YORK.
Measures of effectiveness of transportation
                                                                                                                                                                                             p0022 N82-13014
                                                                                                                               [DE81-029833]
                                                                                                                    p0022 N82-1
SYSTEMS TECHNOLOGY CORP., IRBIA, OHIO.
Conversion of nunicipal solid waste to energy,
Jacksonville, Florida, phase 1
[DE82-000808] p0019 N82-1
          systems management
          [PB81-233884]
                                                                          p0026 N82-13984
SOLAREX CORP., BOCKVILLE, HD.

A Hodule Experimental Process System Development
                                                                                                                                                                                              p0019 N82-12613
          Unit (MEPSDU)
          [ NASA-CE-165014]
                                                                          DOC76 M82-13496
                                                                                                                    TATA ENERGY RESEARCH INST., BOMBAY (IHDIA).
Water-pumping-windmill designs: A handbook
[DE81-904016] P0137 N82-105.
TATA INST. OF FUNDAMENTAL RESEARCH, BOMBAY (IHDIA).
      Silicon solar cell optimization
[AD-A106005] p0076

SOLARRIECTROBICS, IWC., BELLIMGHAM, MASS.

Flat-plate solar array project. Task 1:

Silicon material: Investigation of the
                                                                          p0076 N82-13514
                                                                                                                                                                                              p0137 N82-10536
                                                                                                                           Indian energy abstracts
[PB81-232316]
          hydrochlorination of SiC1sub4
                                                                                                                                                                                              D0032 N82-15591
          [NASA-CR-165042]
                                                                          P0078 N82-14631
                                                                                                                     TECHNICAL RESEARCH CENTRE OF FINLAND, ESPOO.
                                                                                                                          The properties of solar and heat pump heating systems of small houses and additional heat
SOUTH CAROLINA ENERGY RESPARCE INST., CCLUMBIA.
      Residual-energy-applications program:
EAST-facility requirements document
[DE81-027489] p0
                                                                                                                               sources
                                                                         P0014 N82-11616
                                                                                                                              [ VII-56]
      Residual-energy-applications program environmental analysis report
                                                                                                                     TECHNISCHE HOCHSCHULE, AACHEM (WEST GERHANY).
Selection and testing of suitable coating
          [DE81-027538]
                                                                          p0024 N82-13525
                                                                                                                              systems for steel pipes used for long distance
      Residual-energy-application program: EAST
                                                                                                                               heat transfer
                                                                                                                     [BMFT-FB-T-81-138] p0150 N82-15134 TECHNISCHE UNIVERSITART, HAMOVER (WEST GERMANY).
Rotating regenerative heat exchanger for energy
facility requirements document, volume 1
[DE81-027536] p0142 N
SOUTHERN METHODIST UNIV., DALLAS, TEX.
                                                                          p0142 N82-13526
      Thin-film polycrystalline cadmium telluride
                                                                                                                               recovery in chemical plants
                                                                                                                     [BMFT-FB-T-81-099] p0030 N8.
TEKNEKRON, INC., MCLEAN, VA.
Environmental readiness document. Advanced
                                                                                                                                                                                               D0030 N82-15367
          solar cells and large-area polycrystalline
          silicon solar cells
                                                                          D0062 N82-10490
                                                                                                                              Isotope Separation Program
      Thin film photovoltaic devices
                                                                                                                              [DB81-029952]
                                                                          p0063 N82-10491
                                                                                                                                                                                              p0029 N82-14900
                                                                                                                           Coal resources and sulphur emission regulations:
A summary of 8 eastern and midwestern states
[PB81-240319] p0031 N82-155
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
      Characterization of diesel emissions as a
function of fuel variables
[PB61-244048] p0118 N82

SPECTROLAB, INC., SYLMAR, CALIF.

High resolution, lcw cost solar cell contact
                                                                                                                                                                                             p0031 N82-15514
                                                                                                                     TELEDINE BROWN ENGINEERING, HUNTSVILLE, ALA.
Investigation of direct solar-to-microwave
                                                                          p0118 N82-15233
                                                                                                                               energy conversion techniques
                                                                                                                               [NASA-CR-161883]
           development
development
[NASA-CR-165032] p0076 N82-1350

SPECTROM DEVELOPMENT LABS., INC., COSTA MESA, CALIF.
Particulate processes in rulverized-coal flames
[DE81-025153] p0093 N82-1015

SRI INTERNATIONAL CORP., MENLO PARK, CALIF.
Conceptual design of a glass-reinforced concrete
                                                                                                                     TENNESSEE UNIV. SPACE INST., TULLAHOMA.

Two-dimensional effects in power take-off region
                                                                          pG076 N82-13501
                                                                                                                              [DE82-000091]
                                                                                                                                                                                               p0141 N82-13367
                                                                                                                     TETRA TECH, INC., COLUMBUS, OHIO.
Evaluation of Devonian shale potential in
                                                                         pCC93 N82-10157
                                                                                                                               eastern Kentucky/Tennessee
          solar collector
[DE81-029280]
                                                                                                                     [DE82-001164] p0116 N82-
TEXAS ASM UBIV., COLLEGE STATION.
A computer model of a stirling engine using a
                                                                                                                                                                                               D0116 N82-14595
                                                                          p0065 N82-10542
      Exploratory study of coal-conversion chemistry [DE81-016136] p0119 N82-1
                                                                          p0119 N82-15552
                                                                                                                               two-phase two-component working fluid
STANFORD UNIV., CALIF.
                                                                                                                                                                                               p0137 N82-10492
      Algorithm for computing in-situ combustion oil
                                                                                                                           Identification and toxicity of
          recovery performance [DE81-030340]
                                                                                                                               fractionated-shale-oil components
                                                                           pC098 N82-11153
                                                                                                                                                                                               p0021 N82-12766
                                                                                                                               [DE81-028460]
                                                                                                                     TEXAS TECHNOLOGICAL UNIV., LUBBOCK.
Pulsed Power Research colloquium
      Blectrical effects of slag in a diffuse mode
           magnetohydrodynamic generator
                                                                                                                              [AD-A105770]
                                                                                                                                                                                               D0150 N82-14638
                                                                          p0143 N82-13550
STARCK (HERMANN C.) BERLIN, GOSLAR (WEST GERMANY).
Development of a process for recovery of
                                                                                                                     TEXAS UNIV., AUSTIN.
Tertiary oil recovery processes research at the
                                                                                                                           University of Texas
[DE81-025222] p0096 Notes and the policy of the poli
          valuable components from complex
                                                                                                                                                                                               p0096 N82-10477
           hydrodesulfurization catalysts especially
           tungsten, molyndenum, vanadium, nickel and
                                                                                                                               tertiary sandstones: Texas Gulf Coast
          cobalt
          [BMFT-FB-T-80-186]
                                                                          p0016 N82-12204
                                                                                                                               [DE81-029772]
                                                                                                                                                                                              p0117 N82-15225
STATE UNIV. OF BRW YORK, PINGHAMTON.
Desulfurization with transition metal catalysts
                                                                                                                           Structural evolution of three
                                                                                                                               geopressured-geothermal areas in the Texas
                                                                          pC092 N82-10143
[DE81-028935]
STATE UNIV. OF NEW YORK AT ALBANY.
                                                                                                                              Gulf Coast
[DE81-029799]
                                                                                                                                                                                               D0118 N82-15505
      Site selection for small wind energy conversion
                                                                                                                     TEXAS UNIV. AT DALLAS.
          systems for US Department of Energy field
                                                                                                                           Oil and gas industry and environmental
           evaluation program
                                                                                                                               pollution: Application of systems reliability
           [PB81-226862]
                                                                          p0014 N82-11624
                                                                                                                               analysis for the evaluation of the status of
                                                                                                                               environmental pollution control in the
STOLLER (S. H.) ASSOCIATES, BEW YORK.
      Potential contribution of currently operating nuclear-fueled electric-generating units to
                                                                                                                               Nigerian petroleum industry
                                                                                                                                                                                              p0008 N82-10583
          reducing US oil consumption [DE81-030497]
                                                                                                                     TEXAS UNIV. AT EL PASO.
                                                                                                                           Heat flow studies and geothermal exploration in
                                                                          D0031 N82-15553
STRASBOURG UNIV. (PRANCE).
                                                                                                                               western Trans-Pecos Texas
      Economic effects induced by ESA contracts, phase
2. Volume 1: Summary
[ESA-CR(P)-1462-VOL-1] p0161 N82-149
                                                                                                                     p0110 N82~12684
TRANSPORTATION SYSTEMS CENTER, CAMBRIDGE, MASS.
Evaluation of techniques for reducing in-use
[ESA-CR(P)-1462-VOL-1] p0161 N82-14981
SWEDISH INST. FOR MATERIALS TESTING, BORAS.
Aging and corrosion problems with flat solar
energy absorbers. Study based upon literature
                                                                                                                              automotive fuel consumption
                                                                                                                              [ PB81-233298]
                                                                                                                                                                                               p0026 N82-13985
                                                                                                                          Highway fuel economy study [PB81-233850]
          and experiment exchanges [SP-RAPP-1979/4]
                                                                                                                                                                                              D0026 N82-13986
                                                                          DCC77 N82-13548
```

TRI-STATE BEGIOBAL PLANBING COMMISSION, NEW YORK. Measures of effectiveness of transportation systems management [PB81-233884] p0026 N82-13984
TRW DEPRESE AND SPACE SYSTEMS GROUP, REDONDO BRACH, [DE81-030194] CALIF. High power solar array switching regulation p0045 A82-11736 Power management of multi-hundred kilowatt spacecraft power systems D0046 A82-11769 High pressure MHD coal combustors investigation, phase 2 DE81-0272381 TRY ENERGY SYSTEMS, REDONDO EFACE, CALIF. Sampling and analysis of potential geothermal sites [PB81-240061] D0119 N82-15593 TRW, INC., MCLEAN, VA.
Gas recovery from coal deposits [PB81-222291] p0103 N82-11271 Environmental research plan for gas supply technologies. Volume 2: Environmental [DOE/ET-14700/2] research plan [PB81-222317] p0011 N82-11274 Environmental research plan for gas supply technologies. Volume 1: Executive summary [PB81-222309] p0015 882-11657 Electric and hybrid vehicle environmental control subsystem study [NASA-CR-164996] TRW, INC., REDONDO BEACH, CALIF. DC020 N82-12658 Laboratory study for removal of organic sulfur from coal [DE81-025132] p0010 N82-11239 [NASA-CR-165060] TRU, INC., BRSEARCH TRIANGLE PARK, B.C.

Demonstration of Wellman-Lord/Allied Chemical PGD technology: Demontration test second year development [DB81-023104] results [PB81-246316] p0034 N82-15626 TRW ENERGY SYSTEMS PLANNING CIV., MCLEAB, VA.
Underground gasification of steeply dipping
beds. Phase 2 report: Results of Bawlins test [DE81-028581] pC094 N82-10255 [DE81-026698] DORTHUND (WEST GERMANY) . ULTBASYSTEMS, INC., INVINE, CALIF.
Feasibility study report for the Imperial Valley pump plants [BMPT-FB-T-80-109] Ethanol Refinery: A 14.9-million-gallon-per-year ethanol synfuel refinery utilizing geothermal energy [DE82-000288] p0112 N82-1 p0112 N82-13252 UNION OIL CO. OF CALIFORNIA, LOS ANGELES.

Geothermal reservoir assessment: Northern basin and range province Stillwater prospect, Churchill County, Nevada BLACKSBURG. [DE82-000529] p0109 N82-125
UNITED TECHNOLOGIES CORP., SOUTH WINDSOR, COMM.
Evaluation of shale oil as a utility gas-turbine p0109 N82-12516 liquefaction [DE81-029125] fuel [DE81-904234] p0107 N82-12251 Low NO sub x heavy fuel combustor concept program liquefaction [NASA-CR-165512] polyon of a full scale experimental anaerobic fermentation [DE81-025961] facility [DE81-029028] p0110 882-12605 Investigation of the in-situ oxidation of methanol in fuel cells
[AD-A105947] p0143 p0143 N82-14642 UNITED TECHNOLOGIES RESEARCH CENTER, BAST HARTFORD. External fuel Vaporization study [NASA-CR-165513] p0114 N82-14371 reaction product UNITER CORP., SALT LAKE CITY, UTAH.

Bigh-temperature counter-flow recuperator [DE81-031923] p0017 #82-12424 UNIVERSITY OF HORTHERN ILLINOIS, DE KALB. of Washington [DE81-030319] Advanced high temperature thermoelectrics for space power p0125 A82-11823
UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES.
Formation evaluation in liquid-dominated

p0109 N82-12514

pC029 N82-14875

UNIVERSITY OF SOUTHERN MISSISSIPPI, HATTIESBURG. Improved polymers for enhanced oil recovery synthesis and rheology UNITERSITY OF WESTERN MICHIGAN, KALAMAZOO.
Fundamentals of mitric oxide formation in
fossil-fuel combustion [DE81-030329] p0033 H82-156
US ALCOHOL FUELS, EAST MESA, CALIF.
Feasibility study report for the Imperial Valley p0033 N82-15608 Ethanol Refinery: A
14.9-million-gallon-per-year ethanol synfuel
refinery utilizing geothermal energy
p0112 M82-13252 UTAS UNIV., SALT LAKE CITY. Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuels [DOE/8T-14700/1] P0102 N82-112: Chemistry and catalysis of coal liquefaction: Catalytic and thermal upgrading of coal liquid and hydrogenation of CO to produce fuel 102 N82-112: p0102 N82-11259 p0102 N82-11260 Investigation of factors affecting the in-situ combustion retorting of oil shale [DE82-000482] DO106 N82-12200 VANDERBILT UNIV., MASHVILLE, TEBM.
A solar simulator-pumped gas laser for the direct conversion of solar energy D0044 A82-11710 Advanced solar energy conversion p0079 N82-15526 VARTA BATTERIE A.G., KELKHEIM (WEST GERMAN).
Recent advances in lead-acid cell research and D0158 N82-11580 Energy storage systems for terrestrial solar generators
[BHFT-FB-T-81-082] p0080 N82-155
VEDA, INC., CAMARILLO, CALIP.
Economic analysis of the unified heliostat array p0080 N82-15529 p0064 N82-10516 VERBIBIGTE BLEKTRIZITARTSWERKE WESTFALEN A.G., Energy consumption analysis and comparative study of the operational results from heat p0032 N82-15583 VERSAR, INC., SPRINGFIELD, VA.

Coal resources and sulphur emission regulations:
A summary of 8 eastern and midwestern states
[PB81-240319] p0031 N82-15514 VIRGINIA POLYTECHNIC INST. AND STATE UNIV.. Development and application of analytical techniques to chemistry of donor solvent p0099 #82-11166 Development and application of analytical techniques to chemistry of donor solvent D0099 N82-11167 VIRGIBLA UNIV., CHARLOTTESVILLE.

Fundamental investigations on fuel cells for transportation applications p0137 N82-10493

W

WALTHER CIE A.G., COLOGNE (WEST GERMANY).

Process for removing sulfur oxides from gases with direct production of a usable finished reaction product

[BMFT-FB-T-81-102] p0029 N82-15142

WASHINGTON UNIV., SEATTLE.

Chemical and geochemical studies off the coast of Washington

[DE81-030319] p0017 N82-12513

WASHINGTON UNIV. TECHNOLOGY ASSOCIATES, INC., ST.

LOUIS, NO.

Yawing of wind turbines with blade cyclic pitch wariation

[DE81-030091] p0138 N82-11045

geothermal reservoirs

Value tree analysis of energy supply alternatives

[DOE/ET-28384/T1]

[AD-A105629]

WATER RESOURCES COUNCIL, WASHINGTON, D.C. Coal liquefaction demonstration plant near Morgantown, West Virginia: water assessment report section 13(b) p0103 N82-11269 [PB81-216095] Coal liquefaction demonstration plant near Morgantown, West Virginia: Water assessment report [PB81-216103] Great Plains gasification project, Hercer County, North Dakota; water assessment report section 13(c) p0013 N82-11524 [PB81-216111] Great Plains gasification project, Mercer County, North Dakota; water assessment report [PB81-216129] p0013 N82-11 [PB81-216129] p0013 N82-11525
WEISS TECHNIK G.M.B.H., REISKIRCHEN (WEST GERMANY).
Practical demonstration of heat rumps for utilization of animal-generated heat [BMPT-FB-T-80-100] p0017 N82-12403 WEST VIRGINIA UNIV., MORGANTON.
An indoor blade test facility for determining the basic aerodynamic properties of Darrieus wind turbine airfoils with test results for an NACA 0015 and a modified section p0136 N82-10005 Pyrolytic characterization of the organic matter in Selected coals and in the Devonian shales of southern West Virginia p0113 N82-13578
WESTINGHOUSE ELECTRIC CORP., CONCORDVILLE, PA.
Baseline data on utilization of low-grade fuels
in gas turbine applications. Volume 2: Hot component corrosion evaluation [DE81-903760] pC094 N82-10253 WESTINGROUSE RLECTRIC CORP., EAST PITTSBURGH, PA.
Boonomic assessment of advanced central-receiver
solar-thermal rower systems: Executive summary [DOE/SF-10601/0] p0074 N82-WESTINGHOUSE RIECTRIC CORP., PITTSBURGE, PA. Development, testing, and evaluation of MHD materials and component designs. Volume 1: EXECUTIVE SUMMARY p0074 N82-12624 [DE81-026203] p0139 N82-11947 WILLIAMS BROS. ENGINEERING CO., TULSA, CKLA.
Sixth Underground Coal-Conversion Symposium [DE81-027669] p0114
WILLIAMS RESEARCH CORP., WALLED LAKE, MICH.
AGT-102 automotive gas turbine p0114 N82-14374 [NASA-CR-165353] WISCONSIN CENTER FOR PUBLIC FOLICY, MADISON. SOLPLAN report: An assessment of barriers and incentives to conservation and alternative-energy use in the residential sector in Wisconsin [DOB/CS-30292/3] WISCONSIN UNIV., MADISON. Coal combustion in high convective flows [DE81-030391] p0106 N82-12194 Survey of proposed methods of burning alcohol in diesel engines [DE81-025834] WORCESTER POLYTECHNIC INST., MASS. Kinetics and mechanisms of catalytic hydroliquefaction and hydrogasification of lignite [DE81-023581] pG092 N82-10144 WYLE LABS., INC., HUBTSVILLE, ALA.
An analytical comparison of the efficiency of solar thermal collector arrays with and without external manifolds pC063 N82-10501 [NASA-CR-161852] Performance evaluation of the solar kinetics T-700 line concentrating solar collector [NASA-CR-161856] p0063 N82-10502 Evaluation of All-Day-Efficiency for selected flat plate and evacuated tube collectors [NASA-CR-161866] p0063 N

p0063 N82-10504

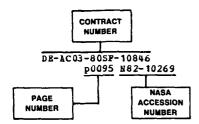
YALE UNIV., NEW HAVER, CONN. Development of newer methods for the isolation and identification of certain components found in complex mixtures derived from energy sources and the determination of their biological activity via bioassay systems [DE81-028311] pG092 N82-10148

Z· EAWADZKI (EDWARD A.) LTD., MCMURRAY, PA.
Preliminary study: Use of low-sulfur coal and
coal cleaning in control of acid rain p0021 N82-12675 [DE81-028930]

RGY / A Continuing Bibliography (Issue 33)

APRIL 1982

Typical Contract Number Index Listing



tings in this index are arranged alphanumerically by contract number, der each contract number, the accession numbers denoting documents t have been produced as a result of research done under that contract arranged in ascending order with the AIAA accession numbers appearing to the accession number denotes the number by which the citation is intified in either the IAA or STAR section.

PROJ. 2301
p0150 N82-14638
PROJ. 2480
p0100 N82-11228
F PROJ. 3145
p0076 N82-13514
F-AFOSR-3675-78
p0150 N82-14638
ID/SOD/PDC-C-0146
p0032 N82-15589
p0032 N82-15590
ID/TA-C-1433
p0032 N82-15592
78/KL/125
p0080 N82-15534
.78/KL4/146
p0032 N82-15596
MPT-PLE-ET-4060-A
p0160 N82-15584
A PROJ. 1L1-61102-AH-51 p0143 N82-14642
DAAK20-79-C-0267
p0154 A82-15726
DAAK70-77-C-0080
p0127 A82-12938
DAAK70-80-C-0049
p0143 N82-14642
DE-AB01-76CS-31020
p0063 N82-10509
p0064 N82-10510 p0064 N82-10511
DE-AB18-78FC-02101
p0093 N82-10249
DE-AB29-76ET-20370
p0143 N82-14633
DE-AC01-76CH-00016 p0093 N82-10153
DE-AC01-76CS-20300
p0101 N82-11246
DE-AC01-76ET-10145
p0118 N82-15508
DE-AC01-76ET-10204
p0112 N82-13248
DE-AC01-76ET-10785
p0143 N82-13926
DE-AC01-76ET-10805
p0139 N82-11947
DE-AC01-77ET-11058
p0129 A82-14030
DE-AC01-77ET-20009
p0110 N82-12605
DE-AC01-78CS-20057

p0011 N82-11318

p0012 N82-11323

```
DE-AC01-78CS-20424
p0110 N82-12596
DE-AC01-78CS-40037
p0095 N82-10262
DE-AC01-78ET-10325
p0093 N82-10152
DE-AC01-78ET-11056
p0099 N82-11158
DE-AC01-79CS-0231
          p0019 N82-12613
DE-AC01-79CS-20240
p0028 N82-14659
DE-AC01-79CS-30027
          p0068 N82-11561
          p0075 N82-12707
DE-AC01-79ER-10000
p0047 A82-11773
DE-AC01-79ET-11268
          p0146 N82-12520
p0017 N82-12521
DE-AC01-79ET-14210
p0146 N82-12525
DE-AC01-79ET-14674
p0094 N82-10257
DE-AC01-79ET-14693
p0109 N82-12524
DE-AC01-79ET-14696
p0101 N82-11243
DE-AC01-79ET-14700
          p0102 N82-11259
DE-AC01-79ET-15518
p0127 A82-12113
p0138 N82-10882
DE-AC01-79ET-21047
          p0054 A82-14013
DE-AC01-79ET-23107-01
p0056 A82-15442
DE-AC01-79ET-25407
p0156 N82-10540
DE-AC01-79EV-10292
p0029 N82-14900
DE-AC01-79PE-70032
p0020 N82-12667
DE-AC01-79RA-2036
p0104 N82-11519
DE-AC01-79RA-20029
    p0104 N82-11523
-AC01-79RA-20216
p0111 N82-13247
DE-AC01-79RG-10004
          p0027 N82-14644
DE-AC01-80CS-50141
p0022 N82-13014
DE-AC01-80ER-30010
         p0010 N82~11249
```

DE-AC01-80ET-14928
p0094 N82-10259 DE-AC01-80ET-15602
p0130 A82-14037
DE-AC01-80ET-15614 p0135 A82-17922
p0135 A82-17923
DE-AC01-80PE-70278 p0009 N82-10601
DE-AC01-81EV-10450
p0021 N82-12671 DE-AC02-76CH-00016
p0136 A82-18394
p0086 N82-11257 p0157 N82-11368
p0067 N82-11413
p0012 N82-11414 p0069 N82-11575
p0070 N82-11583
p0070 N82-11584 p0013 N82-11589
p0108 N82-12255
p0072 N82-12600
p0020 N82-12637 p0021 N82-12842
p0150 N82-13517
p0114 N82-14379 p0114 N82-14381
p0086 N82-14382
p0087 N82-15220 p0150 N82-15338
p0031 N82~15543
p0081 N82-15571 p0119 N82-15604
p0033 N82-15609
p0035 N82-16014
DE-AC02-76CS-52749 p0140 N82-12444
DE-AC02-76ET-11292
p0124 A82-11818 p0124 A82-11821
DE-AC02-76 ET-11293
p0124 A82-11817 p0124 A82-11820
DE-AC02-76ET-20279
p0064 N82-10519 p0065 N82-10558
p0073 N82-12610
p0077 N82-13533 p0079 N82-14656
p0079 N82-14657
DE-AC02-76ET-28359 p0103 N82-11404
DE-AC02-76ET-51013
p0139 N82-11935 DE-AC02-77CH-0017
p0067 N82-11407
DE-AC02-77CH-00178 p0095 N82-10263
p0063 N82-10507
p0064 N82-10512 p0065 N82-10534
p0065 N82-10539
p0007 N82-10544 p0157 N82-10548
p0066 N82-10563
p0066 N82-10569
p0138 N82-11045 p0067 N82-11325
p0068 N82-11557
p0068 N82-11558 p0070 N82-11606
p0070 N82-11609
p0105 N82-11611 p0017 N82-12283
p0072 N82-12608
p0073 N82-12615 p0073 N82-12623
p0074 N82-12626
p0074 N82-12627

p0074 N82-12628

p0075	N82-13265 N82-13528
p0076 p0077	N82-13520
p0024	N82-13531 N82-13539
p0113 p0079	N82-13541 N82-14658 N82-15544 N82-15545
p0081	N82-15544
p0081 p0081	N8 2- 15545
p0081	N82-15569 N82-15576
DE-AC02-77ER-	-04169
p0023 DE-AC02-77ET	N82-13192
p0155	N82-10527
p0156 p0156	N82-10528 N82-10529
p0156	N82-10529
p0156	N82-10530 N82-10546 N82-10574 N82-11620
p0157 p0158	N82-10574
p0158	N82-11621
DE-AC02-78CS-	-20074
p0031 DE-AC02-78ET-	N82-15556 -25309
p0018	N82-12582
DE-AC02-78ET- p0159	-29232 N82-13544
DE-AC02-79-C	
p0019	N82-12604
DE-AC02-79CS- p0068	-30027 N82-11560
DE-AC02-79CS-	-30150
p0062 p0065	N82-10276 N82-10547
p0110	N82-12595
p0073	N82-12595 N82-12612
p0110 p0079	N82-12620 N82-14661
p0081	N82-15563 N82-15564
p0081 DE-AC02-79CS-	
p0030	N82-15219
DE-AC02-79ET- p0141	-10815 N82-13367
DE-AC02-79ET	-15207
p0123 DE-AC02-79ET-	A82-11806 -21067
p00 7 7	N82-14384
DE-AC02-79ET- p0096	-21225 N82-10366
DE-AC02-80CS	-83004
p0108 DE-AC02-80ER-	N82-12260 -10558
p0064	N82-10521
DE-AC02-80ET- p0135	
p0133	
DE-AC02-80ET-	
	A82-11844 -10405
DE-AC02-80EV- p0005	A82-16199
DE-AC02-80EV- p0112	-10414 N82-13475
DR_1CO2_76 PM-	-12056 N82-11153
P0098 DE-AC03-77ET-	
p0094 DE-AC03-78ET-	N82-10255
p0052	A82-13083
DE-AC03-79CS- p0007	-10757 N82-10551
DE-AC03-79ET-	-11343
p0104 DE-AC03-79SP-	N82-11571 -10538
n0143	NR2-13983
DE-AC03-79SP- p0074	N82-12624
DE-AC03-79SE-	-10740
p0048 p0048	A82-11802 A82-11603
カモー WC C 3 - GC 2 E -	10802
p0064	N82-10516

DE-AC03-80SF-10846	DE-AC08-79ET-26306	DE-AI01-77CS-51044
p0095 N82-10269	p0158 N82-11997	p0155 N82-10503
DE-AC04-76DP-00053	DE-AC08-79ET-27012	DE-AIO1-77ET-10769
p0043 A82-11215	p0109 N82-12516	p0137 N82-10495
p0095 #82-10268	DE-AC08-79ET-27111	P0140 N82-12446
DE-AC04-76DP-00789	p0118 N82-15505	p0140 N82-12570
p0037 A82-10008	DE-AC08-79NV-10039	p0141 N82-12943
p0037 A82-10012	p0096 N82-10475	p0144 N82-15527
p0037 A82-10013	DE-AC09-77ET-12866	DB-AIO1-77ET-12547
p0039 A82-10025	p0014 N82-11616	p0098 N82-11145
p0129 A82-14033	p0024 N82-13525	DE-AIO1-77ET-13111
p0057 A82-16055	p0142 N82-13526	p0140 N82-12572
p0060 A82-17255	DE-AC18-80FC-10193	DE-AI01-79CS-50080
p0136 N82-10434	p0014 N82-11642	p0016 N82-11994
p0064 N82-10513	DE-AC19-78BC-20001	DE-AIO1-79ET-20485
p0065 N82-10541	p0096 N82-10477	p0007 N82-10506
p0065 N82-10542	DE-AC21-76ET-10381	p0077 N82-14627
p0065 N82-10543	p0105 N82-12182	DE-AIO1-79ET-29372
p0066 N82-10570	DB-AC21-76ET-10592	p0024 N82-13493
p0066 N82-10863	p0033 N82-15608	DB-AI01-80CS-50194
p0138 N82-11044	DE-AC21-77ET-10296	p0026 N82-13981
p0069 N82-11564	p0094 N82-10251	DE-AIO1-80ER-10160
p0069 N82-11566	DE-AC21-79MC-10389	p0150 N82-13157
p0069 N82-11567	p0116 N82-14595	DB-AI01-81CS-50006
p0069 N82-11568	DE-AC21-80MC-14784	p0023 N82-13243
p0069 N82-11569	p0021 N82-12675	DE-AI01-81ET-20307
p0069 N82-11576	DE-AC22-70ET-14700	p0066 N82-11209
p0071 N82-11617	p0102 N82-11260	p0076 N82-13495
p0141 N82-12591	DE-AC22-76ET-10495	DE-AI04-80AL-12726
p0072 N82-12601	p0106 N82-12198	p0159 N82-12574
p0072 N82-12602	DE-AC22-77ET-10618	DE-A106-79RL-10077
p0073 N82-12616	p0092 N82-10144	p0150 N82-13157
p0073 N82-12618	DE-AC22-78ET-11053	DE-AI21-77ET-13032
p0074 N82-12632	p0138 N82-10888	p0098 N82-11146
p0112 N82-13520	DE-AC22-78ET-11343	DE-AM01-76EI-02295
p0077 N82-13530	p0104 N82-11571	p0006 N82-10334
p0077 N82-13532	DE-AC22-79ET-11053	p0007 N82-10514
p0113 N82-14323	p0135 A82-17914	p0073 N82-12609
p0116 N82-14614	DE-AC22-79ET-14879	DE-AM02-79CH-10012
p0119 N82-15546	p0092 N82-10143	P0047 A82-11778
p0144 N82-15561	DE-AC22-79ET-14941	DB-AS01-76ET-10517
DE-AC04-76EV-01013 p0014 N82-11651	p0097 N82-10938 DE-AC22-80PC-30021	p0100 N82-11236
DE-AC04-78AL-04227	p0099 N82-11168	DE-AS02-76ET-28320 p0139 N82-11585
p0081 N82-15551	DE-AC22-80PC-30041	DE-AS02-76EV-01340
DE-AC05-76ET-10104	p0099 N82-11166	p0008 N62~10592
p0106 N82-12197	p0099 N82-11167	DE-AS02-76EV-02958
DE-AC05-760R-00033	DE-AC22-80PC-30080	p0092 N82-10148
p0113 N82-13538	p0099 N82-11165	DE-AS02-76EV-12195
p0025 N82-13558	DE-AC22-80PC-30098	p0016 N82-11731
p0028 N82-14664 DE-AC05-77ET-10152	p0020 N82-12661 p0021 N82-12673	DE-AS02-77ET-10445 p0092 N82-10141
p0094 N82-10260	DE-AC22-80PC-30141	DE-AS02-77ET-29100
DB-AC06-76RL-01830	p0010 N82-11239	p0140 N82-12590
p0159 N82-12586	DE-AC22-80PC-30264	DE-AS02-79ER-10044
DE-AC06-76RL-01830	p0111 N82-13196	p0028 N82-14648
p0156 N82-10532	DE-AC22-80PC-30292	DE-AS02-80CS-30259
p0097 N82-10655	p0093 N82-10155	p0079 N82-14665
p0098 N82-11149	DE-AC22-8JPC-30294	DE-AS03-78ET-13095
p0102 N82-11258	p0093 N82-10158	p0106 N82-12200
p0011 N82-11320	DE-AC22-80PC-30295	DE-AS05-77ET-12038
p0024 N82-13535	p0014 N82-11641	p0118 N82-15509
p0025 N82-13566	DE-AC22-80PC-30297	DE-AS05-80EV-10404
p0025 N82-13567	p0105 N82-12187	p0021 N82-12766
p0113 N82-13627	DE-AC22-80PC-30298	DE-AT03-76ET-28384
p0115 N82-14383	p0092 N82-10150	p0109 N82-12514
p0159 N82-14652 p0029 N82-14803	DE-AC22-80PC-30300 p0093 N82-10157	DB-AT03-76EV-74010
p0029 N82-14803	DE-AC22-80PC-30304	p0020 N82-12660 p0021 N82-12671
p0117 N82-15226	p0099 N82-11164	DE-AT03-765P-74016
p0160 N82-15510	DE-AC22-80PC-30307	p0142 N82-13451
p0160 N82-15548	p0101 N82-11242	DE-AT04-81AL-16228
p0031 N82-15555	DE-AC22-81PC-40265	p0068 N82-11549
p0119 N82-15560	p0098 N82-11148	DE-A101-79ET-27025
p0032 N82-15598	DE-AC22-81PC-40502	p0013 N82-11535
p0033 N82-15613	p0135 A82-17914	DE-FC03-79SF-10762
DB-AC07-76CS-40259	DE-AC22-81PC-40787	p0115 N82-14522
p0018 N82-12581	p0097 N82-10939	p0115 N82-14523
DB-AC07-76ID-01570	DB-AC22-81PC-41035	DE-PC07-79ID-12014
р0093 N82-10201 р0155 N82-10525	p0093 N82-10154 DE-AI01-76ET-12548	p0007 N82-10562 DE-PC20-78LC-10787
p0008 N82-10525	p0104 N82-11516	p0111 N82-12731
p0010 N82-11265	DE-AI01-76ET-20356	DE-FG01-79RA-20219
p0141 N82-12634	p0067 N82-11548	p0101 N82-11237
p0019 N82-12635	p0076 N82-13492	p0107 N82-12254
p0020 N82-12636	DE-AI01-77CS-51040	DE-FG01-79RA-20223
p0031 N82-15567	p0141 N82-13013	p0101 N82-11240
DE-AC07-80ID-12077	p0141 N82-13114	DE-FG01-80RA-50135
p0017 N82-12424	p0142 N82-13507	p0101 N82-11238
DE-AC08-78ET-11397	p0142 N82-13510	DE-FG01-80RA-50146
p0117 N82-15225	'	p0010 N82-11233

```
DE-FG01-80BA-50357
p0114 N82-14
DE-FG02-78IR-05106
p0110 N82-12
DE-FG02-79CS-30292
p0013 N82-11
DE-FG02-79ER-10541
p0060 A82-17
DE-FG02-80CS-89001
p0129 A82-14
DE-FG02-80IR-1855
         p0114 N82-14
DE-FG02-80R5-10226
          p0138 N82-11
DE-FG02-81AF-92005
p0100 N82-11
DE-FG03-79CS-10045
p0027 N82-14
DE-FG03-79ET-37035
         p0109 N82-12
p0109 N82-12
DE-FG05-77CS-20347
p0068 N82-115
DE-PG05-79ET-60058
p0007 N82-105
DE-FG07-80BA-50308
p0112 N82-132
DE-FG18-79FC-14690
p0109 N82-125
DB-FG22-80PC-30213
p0106 N82-121
DE-FG22-80PC-30217
         p0106 N82-121
DE-PG22-80PC-30249
p0111 N82-129
DE-PG22-80PC-30305
p0008 N82-105
DE-FG22-81PC-40770
p0092 N82-101
DEN3-83
p0142 N82-135
DEN3-107
p0144 N82-155
DEN3-115
         p0159 N82-1244
p0140 N82-1257
DEN3-167
         p0123 A82-1178
p0132 A82-1682
DEN3-180
         p0007 N82-1050
p0077 N82-1462
DEN3-224
         p0137 N82-1049
p0140 N82-1257
DEN3-241
p0142 N82-1349
DEN8-000006
         p0063 N82-1050
p0063 N82-1050
p0063 N82-1050
DI-BM-JO-88144
         p0014 N82-1165
DI-BM-JO-188144
         p0015 N82-1165
DI-DM-JO-177051
         p0146 N82-12525
DI-14-12-150
         p0034 N82-15633
DO-SC-RA-78-19
p0030 N82-15453
DOE-EA-77-A-01-6010
p0117 N82-15165
DOE-EX-76-A-36-1008
         p0013 N82-11535
DOT-HS-7-01789
         p0022 N82-13018
p0022 N82-13019
p0022 N82-13020
DRET-79-1210
p0051 A82-12822
DTFA01-80-C-10030
p0027 N82-14071
DYNATECH PROJ. MGC-2
         p0101 N82-11243
EC-77-A-31-1044
         p0159 N82-12445
EC-77-S-02-4206
         p0140 N82-12590
```

76-01-2308-10	EPRI PROJ. 1079-3	JPL-955089) NGR-15-003-118
p0100 N82-11236	p0006 N82-10254	p0063 N82-10500	p0091 A82-17007
77-S-04-3909	EPRI PEOJ. 1081-1	JPL-955115	NRC 125031155-7-4409
p0106 N82-12200	p0155 N82-10527	p0048 A82-11801	p0055 A82-14846
77-S-05-5603 p0118 N82-15509	p0156 N82-10528 p0156 N82-10529	JPL-955136 p0053 A82-14002	NSF ATM-78-25264 p0147 N82-12543
77-C-01-1012	p0156 N82-10530	JPL-955263	NSP DMR-76-81083
p0077 N82-13531	p0156 N82-10546	P0084 A82-11844	p0038 A82-10014
77-C-01-4042	p0157 N82-10574	JPL-955637	p0038 A82-10015
p0037 A82~10008	p0158 N82-11620	p0048 A82-11799	NSF ECS-80-80-03547
p0037 A82-10010 p0038 A82-10017	p0158 N82-11621 EPRI PROJ. 1081-3	p0048 A82-11800 JPL-955682	p0052 A82-13083 NSF ENG-76-82119
p0042 A82-11185	p0159 N82-13544	p0020 N82-12657	p0089 A82-11033
P0131 A82-14844	EPRI PEOJ. 1134-2	JPL-955683	NSF 22733
p0064 N82-10512	p0114 N82-14380	p0020 N82-12658	p0129 A82-14032
p0065 N82-10534	EPRI PEOJ. 1210-1	JPL-955688	NSG-1425
p0007 N82-10544 p0157 N82-10548	p0009 N82-10599 EPRI PROJ. 1274-1	p0078 N82-14630 JPL-955725	p0061 A82-18287 NSG-3230
p0137 N82-10559	p0019 N82-12593	p0076 N82-13501	p0142 N82-13507
p0161 N82-10565	p0019 N82-12594	JPL-955902	N00014-75-C-0648
p0066 N82-10568	EPRI PROJ. 1348-1	p0076 N82-13496	p0042 A82-11185
p0138 N82-11045	p0137 N82-10524	JPL-956061	N00014-75-C-0711
p0067 N82-11325 p0067 N82-11407	BPRI PROJ. 1415-1 p0064 N82-10515	p0078 N82-14631 MDA903-80-C-0194	p0111 N82-12735 N00019-80-K-0507
p0070 N82-11606	EPRI PEOJ. 1432-1	p0029 N82-14875	p0113 N82-14317
p0105 N82-11611	p0035 N82-16012	MIPR-2-70099	N00024-78-C-5384
p0017 N82-12283	p0035 N82-16013	p0024 N82-13512	p0024 N82-13512
p0074 N82-12626	EPR1 PROJ. 1691-2	NAG3-29	N62470-80-C-3736
p0074 N82-12627 p0074 N82-12628	p0107 N82-12251 EPRI PEOJ. 1802	p0045 A82-11712 NAG3-100	p0116 N82-14639
p0110 N82-12633	p0141 N82-12592	p0143 N82-14520	PROJ. 1013 p0112 N82~13252
p0075 N82-13265	EPRI PROJ. 2806-1	NASA ORDER C-57307-D	po 112 doz - 13232
pJ076 N82-13528	p0096 N82-10275	p0023 N82-13243	W-31-109-ENG-38
p0024 N82-13539	ER-78-C-01-6654	NASA ORDER S-40256-B	p0093 N82-10156
p0113 N82-13541	p0001 A82-11543 ER-78-84-4266	p0118 N82-15489	p0095 N82~10267
p0079 N82-14658 p0081 N82-15544	p0060 A82-17254	NASW-3198 p0086 N82-11223	p0096 N82-10479 p0137 N82-10553
p0160 N82-15558	ESA-3702/78/F-DKR (SC)	NASW-3199	p0157 N82-10556
p0081 N82-15569	p0161 N82-14981	p0086 N82-11225	p0157 N82-10557
p0082 N82-15576	ET-77-S-03-1760	NAS2~9539	p0008 N82-10590
p0144 N82-15580	p0106 N82-12200	p0003 A82-14347	p0009 N82-10598
G-77-CH-01-4042	ET-78-C-01-2159	NAS2-10001	p0066 N82~10952
р0070 N82-11609 G-77-G-05-5565	p0159 N82-13544 ET-78-C-01-3084	p0056 A82-15903 p0075 N82-13039	p0157 N82-10962 p0098 N82-11152
p0068 N82-11554	p0099 N82-11158	NAS3-20583	p0100 N82-11169
PA-IAG-D5-E693	ET-78-C-03-2039	p0157 N82-11547	p0101 N82-11244
p0026 N82-13573	p0104 N82-11571	NAS3-21280	p0010 N82-11245
PA-R-804979	ET-78-C-03-2219	p0046 A82-11762	p0011 N82-11317
p0011 N82-11273 PA-R-805558-01	p0043 A82-11343 EX-76-A-29-1012	NAS3-21951 p0078 N82-14636	p0104 N82-11518 p0105 N82-11573
p0009 N82-10605	p0067 N82-11548	p0078 N82-14637	p0158 N82-11578
SPA-68-01-6310	EX-76-C-01-2018	NAS3-21977	p0158 N82-11580
p0015 N82-11679	p0033 N82-15608	p0100 N82-11224	p0014 N82-11644
EPA-68-02-1415	EX-76-C-01-2034	NAS3-22217	p0108 N82-12262
p0015 N82-11654 BPA-68-02-2163	p0106 N82-12198 EY-76-C-02-2520	p0046 A82-11762	p0018 N82-12583 p0018 N82-12587
p0034 N82-15618	p0155 A82-15727	NAS7-100 p0045 A82-11758	p0018 N82-12587
EPA-68-02-2616	EY-76-C-04-3737	p0053 A82-14002	p0028 N82-14650
p0023 N82-13256	p0041 A82-10810	p0063 N82-10496	p0079 N82-15247
BPA-68-02-3136	EY-76-S-03-0113	p0098 N82-11146	W-7405-ENG-26
P0031 N82-15514	p0109 N82-12514	p0066 N82-11209	p0061 A82-17765
PA-68-02-31/0 p0026 N82-13576	P04701-77-C-0078 p0026 NB2-13985	p0104 N82-11516 p0067 N82-11548	p0096 N82-10478 p0157 N82-10549
p0034 N82-15623	F19628-78-C-0005	p0068 N82-11549	p0007 N82-10552
p0035 N82-15651	p0147 N82-12543	p0068 N82-11550	p0007 N82-10561
p0035 N82-15652	P33615-77-C-2059	p0016 N82-11994	p0008 N82-10585
BPA-68-02-3173	p0155 A82-17770	p0107 N82-12240	p0098 N82-11151
p0016 N82-11985 EPA-68-02-3174	F33615-78-C-2039 p0076 N82-13514	p0107 N82-12241 p0142 N82-13386	p0099 N82-11154
p0034 N82-15626	GRI PROJ. 50 14-310-0274	p0142 N82-13386 p0076 N82-13491	p0012 N82-11321 p0103 N82-11405
EPA-68-03-2560	p0087 N82-15231	p0076 N82-13492	p0012 N82-11418
p0119 N82-15593	GRI-5011-321-0101	p0024 N82-13493	p0012 N82-11419
EPA-68-03-2648	p0103 N82-11271	p0076 N82-13495	p0139 N82-11421
p0034 N82-15637	GRI-5014-341-0114	p0026 N82-13981	p0139 N82-11478
EPA-68-03-2707 p0118 N82-15233	p0139 N82-11478 GRI-5014-361-0242	NAS8-32643 p0067 N82-11544	p0013 N82-11574 p0139 N82-11907
EPRI PROJ. TPS-76-661	p0095 N82-10272	NAS8-33605	p0139 882-11307
p0025 N82-13559	GR1-5080-351-0316	p0148 N82-12559	P0109 N82-12400
EPRI PROJ. 234-3	p0011 N82-11274	NAS9-15782	p0074 N82-12625
p0136 N82-10406	p0015 N82-11657	p0071 N82-12544	p0021 N82-12674
EPRI PROJ. 553-2	HPR PROJ. 646	p0147 N82~12546	p0021 N82-12765
p0017 N82-12278 p0071 N82-12279	p0023 N82-13267 HUD-H-2372	NAS9-15800 p0072 N82~12545	p0022 N82-12924 p0111 N82-13245
p0071 N82-12279	p0063 N82-10509	p0072 N82-12545 p0030 N82-15488	p0023 #82-13392
EPRI PROJ. 682-1	p0064 N82-10510	NAS9-15831	p0024 882-13523
p0018 N82-12580	JPL PROJ. 5030-470	p0153 A82-11707	p0024 N82-13536
EPRI PROJ. 1008	p0098 N82-11146	NA63-74 -0127 102 12412	p0025 N82-13560
P0033 N82-15605 EPRI PROJ. 1079-2	JPL PROJ. 5105-76	p0127 A82-12113	p0026 N82-13652 p0116 N82-14680
p0094 882-10253	p0076 N82-13495 JPL PROJ. 5240-11	NCC1-8 p0044 A82-11710 p0079 N82-15526	p0116 N82-14860
	p0076 N82-13492	POC. 2 102 1020	p0030 N82-15210
	· - · · - ·		-

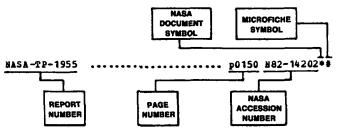
```
p0117 N82-15221
p0031 N82-15553
8-7405-ENG-36
       p0097 N82-10480
        P0065 N82-10537
       p0065 N82-10538
        p0097 N82-10560
       p0138 N82-10961
        p0086 N82-11262
        p0070 N82-11599
       P0070 N82-11600
       p0070 N82-11602
       p0105 N82-11715
        p0139 N82-11944
        p0016 N82-11988
        p0074 N82-12629
       p0074 N82-12630
       p0111 N82-12921
       p0023 N82-13263
       p0112 N82-13473
        p0025 N82-13565
        p0027 N82-14322
       p0150 882-14484
        p0117 N82-15222
       p0144 N82-15454
        p0119 N82-15559
       p0119 N82-15661
8-7405-ENG-48
       p0060 A82-17252
       p0095 N82-10264
       p0155 N82-10508
       p0156 N82-10535
        p0067 N82-11247
       p0102 N82-11248
       p0010 N82-11263
       p0103 N82-11267
       P0104 N82-11474
       p0070 N82-11593
       p0158 N82-11595
        p0158 N82-11596
       p0014 N82-11646
       p0015 N82-11712
       p0016 N82-11995
       p0106 N82-12199
       p0108 N82-12264
        p0159 N82-12396
       p0111 N82-13244
       p0077 N82-13543
       P0026 N82-14048
       p0161 N82-14649
        p0028 N82-14651
       p0159 N82-14655
       p0028 N82-14662
       p0029 N82-14987
       p0117 N82-15227
       p0030 N82-15242
        p0081 N82-15575
       P0082 N82-15577
       P0082 N82-15578
       p0032 N82-15602
       P0033 N82-15607
       p0033 N82-15610
       p0033 N82-15611
       p0035 N82-15833
       p0120 N82-15981
W-7405-ENG-82
       p0161 N82-11012
       p0160 N82-15579
H-7504-ENG-82
p0022 N82-13191
XG-0-9372-1
       P0060 A82-17649
       p0060 A82-17650
XH9-8158-1
       P0038 A82-10014
P0038 A82-10015
XS-9-8275-1
p0058 A82-16131
XS9-8058-2
       p0041 A82-10776
XZ-0-9192-1
       p0058 A82-16469
X50-9002-3
       p0052 A82-13200
ZP43451001
       p0100 N82-11231
311-03-41-08
       P0011 N82-11340
506-55-42
       p0068 N82-11551
```

```
p0150 #82-14202
776-31-41
       p0143 882-14633
776-42-61
       p0104 N82-11516
776-52-41
       p0077 N82-14627
776-52-61
       p0067 N82-11548
776-72-41
       p0159 N82-12574
776-81-61
       p0068 N82-11550
776-81-62
       p0068 N82-11549
778-11-05
       p0140 N82-12446
       p0141 N82-12943
       p0144 N82-15527
778-34-05
       p0026 N82-13981
778-34-35
       p0016 N82-11994
778-36-06
       p0155 N82-10503
p0159 N82-12445
778-37-12
p0023 N82-13243
778-42-02
       p0098 N82-11145
778-43-02
       p0098 N82-11146
778-83-01
       p0103 882-11397
953-36-00-00-72
       p0078 N82-14634
       p0078 N82-14635
```

ENERGY / A Continuing Bibliography (Issue 33)

APRIL 1982

Typical Report / Accession Number Index Listing



Listings in this index are arranged alphanumerically by report number. The page number indicates the actual page where the citation may be located. The accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche.

ACUREX-TR-81-01/SR	p0014	N82-11642 #
AD-A099471	p0024	N82-13512 #
	p0116	N82-14639 #
		N82-11228 #
10 1404500	p0100	N82-11231 #
AD-A104580	p0100	
AD-A104730	p0111	N82-12735 #
AD-A105621	p0027	N82-14071 #
AD-A105629	p0029	N82-14875 #
AD-A105667	p0113	N82-14317 #
AD-A105770	p0150	N82-14638 #
AD-A105947	p0143	N82-14642 #
AD-A106005	p0076	N82-13514 #
AER-466	p0066	N82-10577 #
AEROCHEM-TN-219	p0023	N82-13192 #
AFMD-81-40	p0029	N82-14959 #
AFOSR-81-0686TR	p0150	N82-14638 #
APWAL-TR-81-2052	p0076	N82-13514 #
AFWAL-TR-81-2063	p0100	N82-11228 #
ALMED IN OI-2003	PO 100	BUZ 11220 F
AGESS-810512	p0009	N82-10717 #
AIAA PAPER 81-1705	p0091	A82-14395 #
AIAA PAPER 81-2530	p0053	A82-14001+#
AIAA PAPER 81-2531	p0053	A82-14002*#
AIAA PAPER 81-2532		A82-14003*#
	p0054	A82-14004 #
	p0054	A82-14005*#
22.2		A82-14006 #
200		A82-14007 #
	p0127	
	p0091	
AIAA PAPER 81-2541	E000d	A82-14009 #
AIAA PAPER 81-2546	p0127	A82-14011 #
AIAA PAPER 81-2547		A82-14012 #
AIAA PAPER 81-2549		A82-18223*#
AIAA PAPER 81-2550	p0054	A82-14013 #
AIAA PAPER 81-2551	P0054	A82-14014 #
AIAA PAPER 81-2552	p0054	A82-14015*#
AIAA PAPER 81-2554	p0061	A82-18222*#
AIAA PAPER 81-2557		
		A82-14016 #
AIAA PAPER 81-2558		A82-14016 # A82-14017 #
25.50	p0128 p0128	
AIAA PAPER 81-2559	p0128 p0128 p0128	A82-14017 # A82-14018 #
AIAA PAPER 81-2559 AIAA PAPER 81-2560	p0128 p0128 p0128 p0128	A82-14017 # A82-14018 # A82-14019
ATAA PAPER 81-2559 ATAA PAPER 81-2560 ATAA PAPER 81-2561	p0128 p0128 p0128 p0128 p0128	A82-14017 # A82-14018 # A82-14019 A82-14020 #
ATAA PAPER 81-2559 ATAA PAPER 81-2560 ATAA PAPER 81-2561 ATAA PAPER 81-2563	P0128 p0128 p0128 p0128 p0128 p0128 p0003	A82-14017 # A82-14018 # A82-14019 A82-14020 # A82-14021 #
ATAA PAPER 81-2559 ATAA PAPER 81-2560 ATAA PAPER 81-2561	p0128 p0128 p0128 p0128 p0128	A82-14017 # A82-14018 # A82-14019 A82-14020 #

AIAA PAPER 81-2569	p0129 A82-14026 #
AIAA PAPBB 81-2570	P0129 A82-14027 #
AIAA PAPER 81-2571	p0129 A82-14028 #
AIAA PAPER 81-2572	p0129 A82-14029 #
AIAA PAPER 81-2574	p0129 A82-14030 # p0129 A82-14032 #
AIAA PAPER 81-2575	p0129 A82-14031 #
AIAA PAPER 81-2580	p0129 A82-14033 #
AIAA PAPER 81-2582	P0130 A82-14034 #
AIAA PAPER 81-2586	p0130 A82-14036 #
AIAA PAPER 81-2588	P0130 A82-14037 #
AIAA PAPER 81-2590	p0130 A82-14038 #
AIAA PAPER 81-2592	p0003 A82-14040 # p0136 A82-18220 #
AIAA PAPER 81-2596	p0136 A82-18220 # p0060 A82-17761 #
AIAA PAPER 82-0065	p0061 A82-17762 #
AIAA PAPER 82-0066	p0155 A82-17763 #
AIAA PAPER 82-0067	p0061 A82-17764 #
AIAA PAPER 82-0068	p0061 A82-17765 #
AIAA PAPER 82-0076	p0155 A82-17770 #
AIAA PAPER 82-0325	p0135 A82-17889*#
AIAA PAPER 82-0377	p0135 A82-17913 # p0135 A82-17914 #
AIAA PAPER 82-0380	p0135 A82-17922 #
AIAA PAPER 82-0395	p0135 A82-17923 #
AIAA PAPER 82-0423	p0135 A82-17941*#
AIAA 81-2219	p0002 A82-13457 #
ALO-4227-6	p0081 N82-15551 #
ANL-81-14	p0158 N82-11578 #
ANL-81-30	p0100 N82-11169 #
ANL/CEN/FE-81-1	p0008 N82-10590 #
ANL/CEN/FE-81-4	p0093 N82-10156 #
ANL/CNSV-TM-68	p0011 N82-11317 # p0028 N82-14650 #
ANL/CNSV-TM-76	p0028 N82-14650 # p0019 N82-12621 #
ANL/CNSV-TH-79	p0018 N82-12583 #
ANL/CHSV-TM-80	p0098 N82-11152 #
ANL/CNSV-22	p0101 N82-11244 #
ANL/EES-TH-142	p0014 N82-11644 #
ANL/EES-TM-144	p0105 N82-11573 #
ANL/BES-TM-149	p0010 N82-11245 #
ANL/ES-116	p0104 N82-11518 # p0018 N82-12587 #
ANL/FE-81-56	p0108 N82-12367 #
222, 12 01 01 01000000000000000000000000000	P*****
AR-1	p0111 N82-12985 #
AR-3	p0118 N82-15509 #
ASME PAPER 81-HT-71	p0121 A82-10958 #
ASME PAPER 81-HT-80	p0089 A82-10965 #
ASME PAPER 81-HT-81	p0083 A82-10966 #
ASME PAPER 81-HT-83	p0083 A82-10968 #
ASME PAPER 81-SOL-1	p0041 A82-10969 #
ASME PAPER 81-SOL-2	P0041 A82-10970 #
ASME PAPER 81-SOL-3	P0041 A82-10971 #
ASME PAPER 81-SOL-4	p0042 A82-10972 #
ASSE PAPER 81-SOL-5	p0042 A82-10973 #
ATR-1	p0139 N82-11478 #
в-101-3	p0110 N82-12595 #
BALES-ECCOIN-80-BET-002	p0159 N82-12445*#
BETC/OP-79/2	
BM-OPR-94(2)-81	p0015 N82-11655 # p0014 N82-11652 #
BM-RI-8538	p0024 N82-13489 #
BM-SP-5-81	p0112 N82-13488 #

	CONF-810526-39 p0079 N82-14656 #
BMFT-FB-HA-80-048 pC096 N82-10279 #	CONF-810542-5
	CONF-810545-5p0032 N82-15598 #
BMFT-FB-T-80-076 p0G97 H82-10482 #	CONF-810545-6
BAFT-FB-T-80-100 p0017 N82-12403 #	CONF-810606-75 p0010 N82-11265 #
BMFT-FB-T-80-109 p0032 N82-15583 #	CONF-810622-3
BMFT-FB-T-80-125 p0020 N82-12641 #	CONF-810622-4
BMFT-FB-T-80-133 p0C66 N82-10571 #	CONF-810642-5
BHFT-FB-T-80-157 p0008 N82-10572 #	CONF-810672-5p0012 N82-11418 #
BMFT-FB-T-80-182 p0025 N82-13547 #	CONF-810672-7p0012 N82-11419 #
BHFT-FB-T-80-186	CONF-810672-11p0139 N82-11421 #
BMFT-FB-T-80-188	CONF-810672-16
BMFT-FB-T-80-189	CONF-810672-22p0012 N82-11414 #
BMFT-FB-T-80-194	CONF-810674-2p0114 N82-14379 #
BHFT-FB-T-81-012 p0086 N82-12266 #	CONF-810674-3p0115 N82-14383 #
BMPT-FB-T-81-047	CONF-810674-5p0033 N82-15613 #
BMFT-PB-T-81-050	CONP-810699-1
BMFT-FB-T-81-082	CONF-810714-2
BMFT-FB-T-81-097	CONP-810726-2 p0020 N82-12637 #
BMFT-FB-T-81-099	CONF-810733-1
BMPT-PB-T-81-101	CONF-810742-1 p0112 N82-13473 #
BMPT-PB-T-81-102 p0029 882-15142 #	CONF-810742-3
BMFT-FB-T-81-111	CONF-810757-2 p0031 N82-15555 #
BMPT-FB-T-81-138	CONF-810802-2
BMFT-FB-T-81-154	CONF-810808-2 p0086 N82-11257 #
BMPT-FB-T-81-156 p0080 N82-15538 #	CCNF-810808-6
BMPT-PB-T-81-165 p0080 N82-15541 #	CONF-810808-7p0066 N82-10570 #
BdFT-FB-T-81-168 p0030 N82-15168 #	CONF-810808-9
	CONF-810812-2
BMI-2086 pCC97 N82-1C938 #	CONF-810812-4
	CONF-810812-7
BNL-22952p0033 N82-15609 #	CONF-810812-11 p0097 N82-10560 #
BNL-29281	CONF-810812-31p0158 N82-11997 #
BNL-29461 p0086 N82-14382 #	CONF-810812-32 p0024 N82-13523 #
BNL-29520 p0087 N82-15220 #	CONF-810812-34
BNL-29592 p0012 N82-11414 #	CONF-810812-35p0074 N82-12625 #
BNL-29668	CONF-810814-6
BNL-29677 p0067 N82-11413 #	CONF-810832-1p0065 N82-10537 #
BNL-29678 p0C70 N82-11583 #	CONF-810832-2
BNL-29680 p0070 N82-11584 #	CONF-810833-7p0159 N82-14655 #
BNL-29720	CONF-810833-8
BNL-29747 p0020 N82-12637 #	CONF-810833-9 p0160 N82-15510 #
BNL-29751 p0031 N82-15543 #	CONF-810835-2
BNL-29764 p0114 N82-14381 #	CONF-810835-4
BNL-29773	CONF-810835-15
BNL-29857p0035 N82-16014 #	CONF-810841-1
BNL-29881 p0021 N82-12842 #	CONF-810864-1
BNL-29900p0150 N82-13517 #	CONF-810865-1
BNL-29932 p0150 N82-15338 #	CONF-810905-3
BNL-29953p0119 N82-15604 #	CONF-810909-4
BNL-29970 p0081 N82-15571 #	COMP-810911-3
BNL-51321	CONF-810912 p0081 N82-15572 #
BNL-51370p0157 N82-11368 #	
	CONF-810912-3
BNL-51394pc072 N82-12600 #	
BNL-51394	CONF-810912-4 p0070 N82-11584 #
BNL-51394	CONF-810912-4
BNL-51423 p0108 N82-12255 #	CONF-810912-4
BNL-51394	CONF-810912-4
DNL-51423	CONF-810912-4
DNL-51423	CONF-810912-4
BNL-51423 p0108 N82-12255 # CIR/BOSTID/38 p0032 N82-15592 #	CONF-810912-4 p0070 N82-11584 # CONF-810912-8 p0070 N82-11593 # CONF-810912-10 p0087 N82-11413 # CONF-810912-11 p0082 N82-15576 # CONF-810912-13 p0082 N82-15577 # CONF-810914-6 p0116 N82-15152 #
DNL-51423	CONF-810912-4
DNL-51423	CONF-810912-4
DNL-51423	CONF-810912-4 p0070 N82-11584 # CONF-810912-8 p0070 N82-11593 # CONF-810912-10 p0087 N82-11413 # CONF-810912-11 p0082 N82-15576 # CONF-810912-13 p0082 N82-15577 # CONF-810914-6 p0116 N82-15152 # CONF-810923-1 p0015 N82-11712 # CONF-810923-2 p0102 N82-11248 # CONF-810923-6 p0111 N82-13244 # CONF-810923-7 p0108 N82-12264 #
DNL-51423	CONF-810912-4 p0070 N82-11584 # CONF-810912-8 p0070 N82-11593 # CONF-810912-10 p0087 N82-11413 # CONF-810912-11 p0082 N82-15576 # CONF-810912-13 p0082 N82-15577 # CONF-810923-1 p0116 N82-15152 # CONF-810923-2 p0105 N82-11712 # CONF-810923-6 p0111 N82-13244 # CONF-810923-7 p0108 N82-12264 # CONF-810925-3 p0070 N82-11599 #
DNL-51423	CONF-810912-4
BNL-51423	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-81092-11 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810923-7 CONF-810923-7 CONF-810923-7 CONF-810925-3 CONF-810925-4 CONF-810925-6 P0070 N82-11524 CONF-810925-6 P0070 N82-11602 CONF-810925-6 P0070 N82-11602 CONF-810925-6 P0070 N82-11602
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0139 N82-11944 \$ CONF-81045-1 p0116 N82-14658 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800618-8 p0009 N82-10598 \$ CONF-800612-6 p0157 N82-10962 \$ CONF-800617-8 p0114 N82-10553 \$ CONF-800716 p0114 N82-14374 \$ CONF-800804-40 p0066 N82-10952 \$	CONF-810912-4 p0070 N82-11584 # CONF-810912-8 p0070 N82-11593 # CONF-810912-10 p0067 N82-11413 # CONF-810912-11 p0082 N82-15576 # CONF-810912-13 p0082 N82-15577 # CONF-810912-1 p0116 N82-15152 # CONF-810923-1 p0102 N82-11712 # CONF-810923-2 p0102 N82-11724 # CONF-810923-6 p0111 N82-13244 # CONF-810925-3 p0070 N82-11599 # CONF-810925-4 p0070 N82-11502 # CONF-810925-6 p0070 N82-11600 # CONF-810925-7 p0074 H82-12629 #
DNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0139 N82-11944 \$ CONF-81085-1 p0116 N82-14680 \$ CONF-80940-2 p0079 N82-14688 \$ CONF-800438 p0006 N82-10277 \$ CONF-800608-8 p0009 N82-10598 \$ CONF-800612-6 p0157 N82-10962 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800716 p0114 N82-14374 \$ CONF-800804-40 p0066 N82-10952 \$ CONF-800806-46 p0157 N82-10557 \$	CONF-810912-4
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800608-8 p0006 N82-10277 \$ CONF-800608-8 p0157 N82-10998 \$ CONF-800617-8 p0157 N82-10953 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800804-40 p0114 N82-14374 \$ CONF-800804-40 p0157 N82-10557 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-801011-VOL-3 p0144 N82-15893 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810923-7 CONF-810925-8 CONF-810925-4 CONF-810925-4 CONF-810925-7 CONF-810925-7 CONF-810925-8 CONF-810925-9 P0070 R82-11602 ####################################
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0139 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800608-8 p0006 N82-10277 \$ CONF-800612-6 p0157 N82-10598 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800716 p0137 N82-10553 \$ CONF-800804-40 p0166 N82-10952 \$ CONF-800804-40 p0167 N82-10557 \$ CONF-801011-VOL-3 p0144 N82-15893 \$ CONF-801126-3 p0144 N82-15543 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810923-7 CONF-810925-3 CONF-810925-3 CONF-810925-4 CONF-810925-4 CONF-810925-7 CONF-810925-7 CONF-810925-7 CONF-810925-8 CONF-810925-9 CONF-810925-12 CONF-810925-12
DNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0139 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800612-6 p0157 N82-10598 \$ CONF-800617-8 p0157 N82-10553 \$ CONF-800617-8 p0114 N82-1553 \$ CONF-800804-40 p0166 N82-10952 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-801011-VOL-3 p0144 N82-15593 \$ CONF-801126-3 p0031 N82-15543 \$ CONF-801126-3 p0031 N82-15543 \$ CONF-801126-3 p0029 N82-14803 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810923-7 CONF-810923-7 CONF-810923-7 CONF-810923-7 CONF-810923-7 CONF-810925-8 CONF-810925-8 CONF-810925-9 CONF-810925-12 CONF-810925-9 CONF-810925-12 CONF-810925-12 CONF-810925-12 CONF-810925-12 CONF-810925-12 CONF-810925-12 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-13
DNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0139 N82-11944 \$ CONF-81085-1 p0116 N82-14658 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800608-8 p0009 N82-10598 \$ CONF-800612-6 p0157 N82-10962 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800716 p0137 N82-10553 \$ CONF-800804-40 p0066 N82-10952 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-801011-VOL-3 p0144 N82-15593 \$ CONF-801126-3 p0031 N82-15543 \$ CONF-801143-2 p0029 N82-14803 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-3 CONF-810925-3 CONF-810925-4 CONF-810925-4 CONF-810925-9 CONF-810925-9 CONF-810925-1 CONF-810925-12 CONF-810925-13 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14680 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800608-8 p0006 N82-10277 \$ CONF-800612-6 p0157 N82-10598 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800716 p0114 N82-14374 \$ CONF-800804-40 p0157 N82-10557 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-8011178 p0144 N82-15893 \$ CONF-801178 p0029 N82-14643 \$ CONF-801178 p0079 N82-1067 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-6 CONF-810923-7 CONF-810925-3 CONF-810925-3 CONF-810925-4 CONF-810925-4 CONF-810925-7 CONF-810925-7 CONF-810925-8 CONF-810925-9 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-17
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800608-8 p0009 N82-10598 \$ CONF-800617-8 p0157 N82-10553 \$ CONF-800617-8 p0114 N82-14374 \$ CONF-800804-40 p0114 N82-10557 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-8011126-3 p0144 N82-15893 \$ CONF-8011178 p0029 N82-14803 \$ CONF-801178 p0029 N82-14643 \$ CONF-801263-1 p0096 N82-10267 \$ CONF-801263-1 p0096 N82-10479 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-3 CONF-810925-3 CONF-810925-4 CONF-810925-4 CONF-810925-9 CONF-810925-9 CONF-810925-1 CONF-810925-12 CONF-810925-13 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800608-8 p0009 N82-10598 \$ CONF-800617-8 p0157 N82-10553 \$ CONF-800617-8 p0114 N82-14374 \$ CONF-800804-40 p0114 N82-10557 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-8011126-3 p0144 N82-15893 \$ CONF-8011178 p0029 N82-14803 \$ CONF-801178 p0029 N82-14643 \$ CONF-801263-1 p0096 N82-10267 \$ CONF-801263-1 p0096 N82-10479 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-810923-1 CONF-810923-2 CONF-810923-6 CONF-810923-7 CONF-810925-3 CONF-810925-7 CONF-810925-7 CONF-810925-9 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-13 CONF-810925-13 CONF-810925-13 CONF-810925-13 CONF-810925-13 CONF-810925-17
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0139 N82-11944 \$ CONF-81085-1 p0116 N82-14658 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800612-6 p0157 N82-10598 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800716 p0114 N82-14374 \$ CONF-800804-40 p0066 N82-10952 \$ CONF-801011-VOL-3 p0144 N82-15893 \$ CONF-801126-3 p0031 N82-15543 \$ CONF-801178 p0029 N82-14603 \$ CONF-801120-26 p029 N82-14643 \$ CONF-801233-10 p0105 N82-11588 \$ CONF-801263-1 p0096 N82-10479 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-810923-1 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810925-3 CONF-810925-4 CONF-810925-8 CONF-810925-8 CONF-810925-9 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-17 CONF-810925-18 CONF-810925-18 CONF-810925-19 CO
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800608-8 p0006 N82-10277 \$ CONF-800612-6 p0157 N82-10958 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-8006076 p0157 N82-10553 \$ CONF-800804-40 p0144 N82-14374 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-8011126-3 p0144 N82-15593 \$ CONF-8011178 p0194 N82-15513 \$ CONF-801178 p0029 N82-14803 \$ CONF-801178 p0029 N82-14643 \$ CONF-801233-10 p0096 N82-10267 \$ CONF-801263-1 p0096 N82-10479 \$ CONF-801266 p0096 N82-10479 \$ CONF-801266 p0093 N82-15610 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810925-3 CONF-810925-4 CONF-810925-4 CONF-810925-8 CONF-810925-9 CONF-810925-1 CONF-810933-1 CONF-810933-1 CONF-810942-6 P0002 N82-15581 #
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800612-6 p0157 N82-10958 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800804-40 p0144 N82-14374 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-8011126-3 p0144 N82-15593 \$ CONF-8011178 p0144 N82-15893 \$ CONF-801178 p0029 N82-14643 \$ CONF-801120-26 p0095 N82-10267 \$ CONF-801233-10 p0096 N82-10267 \$ CONF-801263-1 p0096 N82-10267 \$ CONF-801266 p0033 N82-15610 \$ CONF-810151-1 p0022 N82-13191 \$ CONF-810217-19 p0029 N82-13911 \$ CONF-810217-19 p0029 N82-15604 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810925-3 CONF-810925-4 CONF-810925-4 CONF-810925-7 CONF-810925-7 CONF-810925-8 CONF-810925-1 CONF-810942-6 CONF-810942-6 CONF-810942-6 CONF-810942-6 P00082 N82-15581 CONF-810942-6 P00082 N82-15581
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800612-6 p0157 N82-10958 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800804-40 p0144 N82-14374 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-8011126-3 p0144 N82-15593 \$ CONF-8011178 p0144 N82-15893 \$ CONF-801178 p0029 N82-14643 \$ CONF-801120-26 p0095 N82-10267 \$ CONF-801233-10 p0096 N82-10267 \$ CONF-801263-1 p0096 N82-10267 \$ CONF-801266 p0033 N82-15610 \$ CONF-810151-1 p0022 N82-13191 \$ CONF-810217-19 p0029 N82-13911 \$ CONF-810217-19 p0029 N82-15604 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-810923-1 CONF-810923-2 CONF-810923-6 CONF-810923-7 CONF-810925-3 CONF-810925-7 CONF-810925-4 CONF-810925-7 CONF-810925-8 CONF-810925-13 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-13 CONF-810925-13 CONF-810925-17 CONF-810942-6 CONF-810942-6 CONF-810946-1 CONF-810946-1 P0003 N82-115545 #CONF-810946-1 P0003 N82-15545
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800612-6 p0157 N82-10968 \$ CONF-800617-8 p0157 N82-10953 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800804-40 p0144 N82-14374 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-801011-VOL-3 p0144 N82-1553 \$ CONF-801143-2 p0144 N82-15893 \$ CONF-801178 p0029 N82-14803 \$ CONF-801233-10 p0029 N82-14803 \$ CONF-801233-10 p0096 N82-10267 \$ CONF-801233-10 p0096 N82-10479 \$ CONF-801266 p0099 N82-15610 \$ CONF-810217-19 p0029 N82-13504 \$ CONF-810217-19 p0029 N82-13504 \$ CONF-810217-19 p0029 N82-13504 \$ CONF-810217-19 p0019 N82-15604 \$ CONF-810261-1 p0119 N82-15604 \$ CONF-81026	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810914-6 P0082 CONF-810923-1 CONF-810923-1 CONF-810923-2 P0102 CONF-810923-7 CONF-810925-3 P0108 CONF-810925-4 CONF-810925-7 CONF-810925-7 CONF-810925-8 CONF-810925-8 CONF-810925-12 CONF-810925-13 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-15 CONF-810925-17 CONF-810925-15 CONF-810925-17 CONF-810933-1 CONF-810946-1 CONF-810946-1 CONF-810946-1 CONF-810046-2 CONF-811006-2 CONF-811006-3 P0008 N82-15545 CONF-810046-1 CONF-810046-1 CONF-810046-1 CONF-81006-2 CONF-811006-3 P0008 N82-15545 CONF-811006-3
DNL-51423	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810925-3 CONF-810925-4 CONF-810925-4 CONF-810925-8 CONF-810925-8 CONF-810925-1 CONF-810942-6 DOO74 N82-12623 \$ CONF-810942-6 DOO78 N82-15551 \$ CONF-810942-6 DOO81 N82-15551 \$ CONF-810942-6 DOO81 N82-15551 \$ CONF-810942-6 DOO81 N82-15551 \$ CONF-81006-2 DOO81 N82-15558 \$ CONF-811006-3 DOO82 N82-15558 \$
DNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800608-8 p01057 N82-10558 \$ CONF-800617-8 p0157 N82-10553 \$ CONF-800617-8 p0114 N82-10553 \$ CONF-800804-40 p0114 N82-10557 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-8011126-3 p0144 N82-15593 \$ CONF-8011178 p0144 N82-15593 \$ CONF-801178 p0029 N82-14643 \$ CONF-8011210-26 p0095 N82-14643 \$ CONF-801263-1 p0096 N82-10267 \$ CONF-801263-1 p0096 N82-10479 \$ CONF-801261-1 p0029 N82-14910 \$ CONF-810217-19 p0157 N82-1556 \$ CONF-810315-13 p0157 N82-1556 \$ CONF-810319-3 p0033 N82-15600 \$ CONF-810315-13 p0157 N82-10556 \$ CONF-810315-13 p0157 N82-10556 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810319-3 p0033 N82-15607 \$ CONF-810319-1 p0033 N82-15609 \$ CONF-810319-3 p0033 N82-15607 \$ CONF-810319-1 p0033 N82-15607 \$ CONF-810319-1 p0033 N82-15607 \$ CONF-81034-1 p0033 N82-15607 \$ CONF-810405-16 p0033 N82-15578 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810925-3 CONF-810925-4 CONF-810925-4 CONF-810925-7 CONF-810925-8 CONF-810925-8 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-13 CONF-810925-14 CONF-810925-15 CONF-810925-16 CONF-810925-17 CONF-810942-6 CONF-810942-6 CONF-810942-6 CONF-810942-6 CONF-810942-6 CONF-810942-6 CONF-810942-6 CONF-810942-6 CONF-81006-3 CONF-811007-3 P00160 N82-15581 CONF-811007-3 P00160 N82-15542 CONF-811007-3 P00160 N82-15554 CONF-811007-3 P00160 N82-15554
DNL-51423	CONF-810912-4 CONF-810912-8 CONF-810912-10 P0067 N82-11584 # CONF-810912-11 P0082 N82-15576 # CONF-810912-13 P0082 N82-15577 # CONF-810912-13 P0082 N82-15577 # CONF-810923-1 P0016 N82-11712 # CONF-810923-2 P0102 N82-11712 # CONF-810923-7 P0108 N82-11248 # CONF-810925-3 P0109 N82-11248 # CONF-810925-4 P0108 N82-12664 # CONF-810925-5 CONF-810925-7 P0108 N82-12627 # CONF-810925-8 CONF-810925-7 CONF-810925-7 CONF-810925-8 CONF-810925-15 P0070 N82-11602 # CONF-810925-15 CONF-810925-17 CONF-810925-17 P0074 N82-12627 # CONF-810925-15 P0077 N82-12628 # CONF-810925-17 P0078 N82-12628 # CONF-810925-17 P0079 N82-12628 # CONF-810946-1 P0079 N82-15571 # CONF-810946-1 P0079 N82-15581 # CONF-81006-2 P0079 N82-15581 # CONF-81007-3 P0079 N82-15581 # CONF-811007-4 P0086 N82-15588 # CONF-811007-4 P0086 N82-15588 # CONF-811007-5 P0087 N82-15520 #
DNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800608-8 p01057 N82-10558 \$ CONF-800617-8 p0157 N82-10553 \$ CONF-800617-8 p0114 N82-10553 \$ CONF-800804-40 p0114 N82-10557 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-8011126-3 p0144 N82-15593 \$ CONF-8011178 p0144 N82-15593 \$ CONF-801178 p0029 N82-14643 \$ CONF-8011210-26 p0095 N82-14643 \$ CONF-801263-1 p0096 N82-10267 \$ CONF-801263-1 p0096 N82-10479 \$ CONF-801261-1 p0029 N82-14910 \$ CONF-810217-19 p0157 N82-1556 \$ CONF-810315-13 p0157 N82-1556 \$ CONF-810319-3 p0033 N82-15600 \$ CONF-810315-13 p0157 N82-10556 \$ CONF-810315-13 p0157 N82-10556 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810319-3 p0033 N82-15607 \$ CONF-810319-1 p0033 N82-15609 \$ CONF-810319-3 p0033 N82-15607 \$ CONF-810319-1 p0033 N82-15607 \$ CONF-810319-1 p0033 N82-15607 \$ CONF-81034-1 p0033 N82-15607 \$ CONF-810405-16 p0033 N82-15578 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810925-3 CONF-810925-4 CONF-810925-8 CONF-810925-9 CONF-810925-17 CONF-810925-18 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810925-10 CONF-810925-10 CONF-810925-11 CONF-810925-12 CONF-810925-13 CONF-810925-15 CONF-810925-15 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-18 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810946-1 CONF-810942-6 CONF-81006-2 CONF-811007-3 CONF-811007-5 CONF-811007-5 CONF-811007-5 CONF-811007-5 CONF-811007-6 PO0087 N82-11520 \$ CONF-811007-6 PO0087 N82-11558 \$ CONF-811007-5 PO0087 PO0087 N82-11520 \$ CONF-811007-6 PO0087 R82-11534 \$ CONF-811007-6 PO0087 R82-11520 \$ CONF-811007-6 PO0087 R82-11584 \$ CONF-811007-6
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p01139 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800608-8 p0009 N82-10598 \$ CONF-800612-6 p0157 N82-10553 \$ CONF-800617-8 p0137 N82-10553 \$ CONF-800716 p0114 N82-14374 \$ CONF-800804-40 p0066 N82-10252 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-80111-VOL-3 p0144 N82-15893 \$ CONF-801178 p0029 N82-14643 \$ CONF-801178 p0029 N82-14643 \$ CONF-801210-26 p0096 N82-10267 \$ CONF-8012233-10 p0105 N82-11588 \$ CONF-801266 p0033 N82-15610 \$ CONF-810217-19 p0029 N82-14910 \$ CONF-810217-19 p0029 N82-14910 \$ CONF-810217-19 p0029 N82-14910 \$ CONF-810315-13 p0157 N82-10556 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810319-1 p0028 N82-11509 \$ CONF-810319-1 p0033 N82-15609 \$ CONF-810319-1 p0033 N82-15609 \$ CONF-810319-1 p0062 N82-115578 \$ CONF-810405-16 p0067 N82-115247 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810925-3 CONF-810925-4 CONF-810925-4 CONF-810925-8 CONF-810925-9 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-13 CONF-810925-14 CONF-810925-15 CONF-810925-15 CONF-810925-17 CONF-810925-17 CONF-810925-18 CONF-810925-19 CONF-810925-19 CONF-810925-10 CONF-810925-10 CONF-810925-10 CONF-810925-11 CONF-810925-11 CONF-810925-12 CONF-810925-13 CONF-810925-14 CONF-810925-15 CONF-810925-17 CONF-810942-6 DOOR-810942-6 DOOR-810942-6 DOOR-810942-6 DOOR-810042-6 DOOR-811006-3 DOOR N82-15558 \$ CONF-811006-3 DOOR N82-15558 \$ CONF-811007-5 DOOR N82-11382 \$ CONF-811007-6 DOOR N82-11384 \$ CONF-811007-6 DOOR N82-114987 \$
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800608-8 p0006 N82-10277 \$ CONF-800612-6 p0157 N82-10598 \$ CONF-800617-8 p0157 N82-10553 \$ CONF-800716 p0114 N82-14374 \$ CONF-800804-40 p0066 N82-10957 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-80111-VOL-3 p0144 N82-15893 \$ CONF-801178 p0144 N82-15893 \$ CONF-801178 p0029 N82-14803 \$ CONF-801178 p0029 N82-14803 \$ CONF-80120-26 p0096 N82-10267 \$ CONF-801233-10 p0105 N82-1056 \$ CONF-801266-1 p0096 N82-10267 \$ CONF-810217-19 p0096 N82-10479 \$ CONF-810217-19 p0033 N82-15604 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810319-3 p0067 N82-11247 \$ CONF-810405-16 p0067 N82-11247 \$ CONF-810405-16 p0067 N82-11247 \$ CONF-810405-16 p0067 N82-11247 \$ CONF-810477-2 p0013 N82-11589 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810925-3 CONF-810925-4 CONF-810925-8 CONF-810925-8 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-13 CONF-810925-13 CONF-810925-14 CONF-810925-15 CONF-810925-17 CONF-810925-17 CONF-810925-18 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810925-10 CONF-810925-10 CONF-810925-10 CONF-810925-11 CONF-810925-11 CONF-810925-12 CONF-810925-13 CONF-810925-15 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-18 CONF-810925-19 CONF-810925-19 CONF-810925-10 CONF-810925-10 CONF-810925-11 CONF-810925-11 CONF-810933-1 CONF-810933-1 CONF-810946-1 CONF-810946-1 CONF-810946-1 CONF-810946-1 CONF-810946-1 CONF-81004-1 CONF-81004-2 CONF-811007-3 CONF-811007-3 CONF-811007-3 CONF-811007-4 CONF-811007-5 CONF-811007-6 CONF-811007-6 CONF-811007-6 CONF-811007-6 CONF-811001-3 CONF-811001-3 CONF-811001-3 CONF-811001-6 CONF-811001-5 CONF-811001-5 CONF-811001-5 CONF-811001-5 CONF-811001-6 CONF-811001-5 CONF-
BNL-51423 p0108 N82-12255 \$ CIR/BOSTID/38 p0032 N82-15592 \$ CONF-81-429-34 p0116 N82-11944 \$ CONF-81085-1 p0116 N82-14668 \$ CONF-81940-2 p0079 N82-14658 \$ CONF-800438 p0006 N82-10277 \$ CONF-800608-8 p0157 N82-10598 \$ CONF-800617-8 p0157 N82-10562 \$ CONF-800617-8 p0157 N82-10553 \$ CONF-800716 p0114 N82-14374 \$ CONF-800804-40 p0066 N82-10952 \$ CONF-800806-46 p0157 N82-10557 \$ CONF-80111-VOL-3 p0144 N82-15893 \$ CONF-801118 p0029 N82-14803 \$ CONF-801178 p0029 N82-14803 \$ CONF-801178 p0029 N82-14643 \$ CONF-80120-26 p0096 N82-10267 \$ CONF-801233-10 p0105 N82-11588 \$ CONF-801266 p0033 N82-15610 \$ CONF-810217-19 p0029 N82-14910 \$ CONF-810217-19 p0029 N82-14910 \$ CONF-810217-19 p0033 N82-15609 \$ CONF-810319-3 p013 N82-15609 \$ CONF-810319-3 p0033 N82-15609 \$ CONF-810405-16 p0033 N82-15609 \$ CONF-810405-1 p0068 N82-11528 \$ CONF-810405-3 p0068 N82-11589 \$ CONF-810405-3 p0068 N82-11589 \$ CONF-810407-2 p0013 N82-11589 \$ CONF-810407-1 p0081 N82-11589 \$ CONF-810526-16 p0081 N82-11575 \$ CONF-810506-16 p0081 N82-11575 \$ CONF-810506-16 p0081 N82-11575 \$ CONF-810506-16 p0081 N82-11522 \$	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-13 CONF-8010912-13 CONF-8010912-13 CONF-8010912-13 CONF-8010912-13 CONF-8010912-13 CONF-8010912-13 CONF-8010923-1 CONF-8010923-1 CONF-8010923-2 CONF-8010923-2 CONF-8010923-3 CONF-8010923-7 CONF-8010925-3 CONF-8010925-3 CONF-8010925-4 CONF-8010925-4 CONF-8010925-7 CONF-8010925-7 CONF-8010925-8 CONF-8010925-8 CONF-8010925-12 CONF-8010925-12 CONF-8010925-13 CONF-8010925-15 CONF-8010925-15 CONF-8010925-17 CONF-8010925-17 CONF-8010925-17 CONF-8010925-18 CONF-8010925-19 CONF-8010925-19 CONF-8010925-10 CONF-8010925-10 CONF-8010925-11 CONF-8010925-11 CONF-8010925-11 CONF-8010925-11 CONF-8010925-11 CONF-8010925-11 CONF-8010925-11 CONF-8010925-12 CONF-8010925-13 CONF-800925-13 CONF-800925-13 CONF-800925-15 CONF-800925-15 CONF-800925-17 CONF-800925-17 CONF-800925-18 CONF-800925-19 CONF-800925-19 CONF-800925-10 CONF-800925-10 CONF-800925-11 CONF-800925-11 CONF-800925-12 CONF-800925-15 CONF-800925-16 CONF-800925-17 CONF-80092
BNL-51423	CONF-810912-4 CONF-810912-8 CONF-810912-10 CONF-810912-11 CONF-810912-13 CONF-810912-13 CONF-810912-13 CONF-810914-6 CONF-810923-1 CONF-810923-2 CONF-810923-2 CONF-810923-7 CONF-810925-3 CONF-810925-4 CONF-810925-8 CONF-810925-8 CONF-810925-12 CONF-810925-12 CONF-810925-13 CONF-810925-13 CONF-810925-13 CONF-810925-14 CONF-810925-15 CONF-810925-17 CONF-810925-17 CONF-810925-18 CONF-810925-19 CONF-810925-19 CONF-810925-19 CONF-810925-10 CONF-810925-10 CONF-810925-10 CONF-810925-11 CONF-810925-11 CONF-810925-12 CONF-810925-13 CONF-810925-15 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-17 CONF-810925-18 CONF-810925-19 CONF-810925-19 CONF-810925-10 CONF-810925-10 CONF-810925-11 CONF-810925-11 CONF-810933-1 CONF-810933-1 CONF-810946-1 CONF-810946-1 CONF-810946-1 CONF-810946-1 CONF-810946-1 CONF-81004-1 CONF-81004-2 CONF-811007-3 CONF-811007-3 CONF-811007-3 CONF-811007-4 CONF-811007-5 CONF-811007-6 CONF-811007-6 CONF-811007-6 CONF-811007-6 CONF-811001-3 CONF-811001-3 CONF-811001-3 CONF-811001-6 CONF-811001-5 CONF-811001-5 CONF-811001-5 CONF-811001-5 CONF-811001-6 CONF-811001-5 CONF-

CONB_044040_4	DD01_005700 -0405 NOO 44644 H
CONF-811018+1	DE81-025708
CONF-811026-2 p0117 N82-15227 #	DE81-025725
CONP-811026-5 p0117 N82-15225 #	DE81-025743
CONF-811026-9	DE81-025828
CONF-811027-1	DE81-025834 p0030 N82-15219 #
CONF-811034-1	DE81-025862
CONF-8006185-1	DE81-025882 p0028 N82-14648 #
CONF-8007107-2 p0013 N82-11574 #	DE81-025906
CONP_0007100 001074 0	DD01-023300 *********************************
CONF-8007109 p0103 N82-11261 #	DE81-025934
CONF-8008118-1 p0158 N82-11580 #	DE81-025960
CONF-8008122	DE81-025961
CONF-8008123-1p0160 N82-15579 #	DE81-025976
CONF-8010129p0074 N82-12632 #	DE81-025983 p0010 N82-11252 #
CONF-8010159-12p0158 N82-11595 #	DE81-026013
CONF-8010198-2 p0016 N82-11731 #	
CONF-8105107-1 p0023 N82-13263 #	DE81-026038
CONF-8106137p0019 N82-12635 #	DE81-026048
CONF-8106137-2	DE81-026055
CONF-8106137-4	DE81-026058
CONF-8106137-5p0031 N82-15567 #	DE81-026059
CONF-8106143p0G79 N82-14657 #	DE81-026086
CONF-8106152-1 p0C97 N82-10655 #	
CONT 0100 132-1	
CONF-81080808 p0105 N82-11611 #	DE81-026146
	DE81-026203 p0139 N82-11947 #
COO-4169-6	DB81-026308
COO-4881-31	DE81-026334
	DE81-026404
CRC-APRAC-CAPI-1-64-517	DE81-026425
	DE81-026477
CSIR-SR-CHNG-330pCC95 N82-10271 #	
COLD-OR-CORG-330 PULYS N82-102/1 #	DE81-026546
au 400 50	DE81-026600
C4100-50 p0C77 N82-14627*#	DE81-026635
_	DE81-026698
DE81-016136 p0119 N82-15552 #	DE81-026750 p0105 N82-11588 #
DE81-021383 p0087 N82-15220 #	DE81-026800
DB81-022685 p0686 N82-14382 #	DE81-026842
DE81-023104 pC158 N82-11580 #	DE81-026849
	DE81-026962
DE81-023127	DE81-027023
DE81-023179 p0066 N82-10570 #	DE81-027078 p0012 N82-11321 #
DE81-023259 p0C95 N82-10269 #	DE81-027091
DE81-023275	DE81-027126
DE81-023359	DE81-027131
DE81-023543	DE81-027138
DE81-023545	DE81-027139
DE81-023572	DE81-027143
DE81-023581 p0092 N82-10144 #	DE81-027188
DE81-023585	DE81-027189
DE81-023810	DE81-027234
DE81-023819	
	DE81-027238
DB81-023928 p0113 N82-14323 #	DE81-027254
DE81-023946 p0137 N82-10559 #	DE81-027263 p0016 N82-11731 #
DE81-024086 p0139 N82-11421 #	DE81-027272
DE81-024129	DE81-027293
DE81-024136	DE81-027361
DB81-024139	DE81-027397
DE81-024250	DE81-027399
DE81-024315 p0007 N82-10562 #	DE81-027447
DE81-024331	DE81-027482
	DE81-027489
DE81-024368	DE81-027526
DB81-024911	DE81-027536 p0142 N82-13526 #
DE81-025018	DE81-027538
DE81-025069 p0069 N82-11575 #	DE81-027557 p0017 N82-12521 #
DE81-025081	DE81-027562
DE81-025086	DE81-027574 p0010 N82-11249 #
DE81-025132	DE81-027622
DB81-025138	DE81-027669
DE81-025153	DE81-027675
DE81-025162	
	DE81-027713 p0117 N82-15227 #
	DE81-027813
DE81-025177 p0013 N82-11574 #	DE81-027817 p0019 N82-12635 #
DE81-025209 p0070 N82-11593 #	DE81-027819
DE81-025222 p0096 N82-10477 #	DE81-027820 p0141 N82-12634 #
DE81-025302	DE81-027853
DE81-025305 p0119 N82-15559 #	DE81-027854
DE81-025336pCC86 N82-11262 #	DE81-027864
DE81-025394 p0119 N82-15546 #	DE81-027938
DE81-025396	DE81-027941
DE81-025408	
DE81-025452	DE81-027961 p0101 N82-11242 #
	DE81-027965
DE81-025471 p0074 N82-12627 #	DE81-027968 p0062 N82-10276 #
DE81-025473 p0074 N82-12626 #	DE81-027976
DE81-025475	DE81-027977p0072 N82-12598 #
DE81-025482	DE81-027979 p0079 N82-15247 #
DE81-025518	DE81-027981
DE81-025559	DE81-028016
DE81-025587	DE81-028041
DE81-025671 p0008 N82-10591 #	DE81-028042

DE81-028047					DE81-029277	******************			
DE81-028052		p0081	N82-15572 #	- 1	DE81-029278		p0018	N82-12526 #	ř
DE81-028054		p0064	N82-10510 #	ı i	DE81-029280	• • • • • • • • • • • • • • • • • • • •	p0065	N82-10542 #	ŧ
DB81-028060	***************************************				DE81-029291	***************************************			
DE81-028084					DE81-029293	•••••			
DE81-028092					DE81-029295	***************************************			
DE81-028098		p0120	N82-15981 #	1	DE81-029314	• • • • • • • • • • • • • • • • • • • •	p0010	N82-11233 #	ř
DE81-028107		p0156	N82-10528 #		DE81-029323	• • • • • • • • • • • • • • • • • • • •	p0150	N82-15338 #	ŧ
DB81-028108				- 1	DE81-029325		p0035	N82-16014 #	ŧ
DB81-028110	***************************************				DE81-029360	•••••			
					DE81-029430				
DE81-028117									
DE81-028121	•••••				DE81-029437	•••••			
DE81-028146		p0065	N82-10547 #	- 1	DE81-029440		p0155	N82-10527 1	ŧ
DE81-028151		p0070	N82-11599 #	1	DE81-029457		p0144	N82-15561	ŧ
DE81-028156		p0079	N82-14665 #	- 1	DE81-029476	***************************************	p0082	N82-15576	į
DE81-028174	•••••				DE81-029480	•••••			
DE81-028175					DE81-029481				
DE81-028178	•••••				DE81-029482	•••••			
DE81-028197				1	DE81-029483				
DE81-028199		p0156	N82-10529 #		DE81-029611		p0073	N82-12618	ŧ
DE81-028200	*******************	p0156	N82-10530 #		DE81-029614		p0102	N82-11258 #	ŧ
DE81-028209		PP00g	N82-11168 #	L	DE81-029618				ŧ
DE81-028232				- 1	DE81-029623	•••••			£
DE81-028235					DE81-029642				
				- 1					
DE81-028265	•••••	P0020	N82-14048 #	ı	DE81-029677	•••••			
DE81-028266	•••••	P0010	M82-11263 #	- 1	DE81-029684	•••••			
DE81-028271		p0031	N82-15567 #	- 1	DE81-029686	• • • • • • • • • • • • • • • • • • • •			
DE81-028299		p0101	N82-11243 #	- 1	DE81-029689				
DE81-028311	•••••	p0092	N82-10148 #	- 1	DE81-029700	• • • • • • • • • • • • • • • • • • • •			
DE81-028312		DC096	N82-10366 #	1	DE81-029701				
DE81-028331				- 1	DE81-029711				
DE81-028335	***************************************	DO11/	N82-14379 #	- 1	DE81-029731				
DE81-028344		20114	NO 2-143/3 T	ı					
	•••••	p000/	N82-11316 #	ı	DE81-029743	••••			
DE81-028348	••••	P0014	N82-11642 #	ı	DE81-029753	•••••			
DE81-028356	•••••			ı	DE81-029772	• • • • • • • • • • • • • • • • • • • •			
DE81-028391				ı	DE81-029799				ŧ
DE81-028401		p0073	N82-12623 #	- 1	DE81-029807		p0094	N82-10257 #	į
DE81-028402		p0074	N82-12630 #	- 1	DE81-029809		p0020	N82-12660 #	į
DE81-028433	••••••	p0079	N82-14657 #		DE81-029821				
DE81-028434	***************************************	E0108	N82-12264 #	- 1	DE81-029833	***************************************			
DE81-028460				- 1	DE81-029844				
				i					
DE81-028465	•••••				DE81-029853	••••			
DE81-028474	•••••			- 1	DE81-029854	• • • • • • • • • • • • • • • • • • • •			
DB81-028490	•••••			- 1	DE81-029857	• • • • • • • • • • • • • • • • • • • •			
DE81-028503				- 1	DE81-029879				ŧ
DE81-028504		p0093	N82-10156 #	1	DE81-029881		p0069	N82-11576 #	ŧ
DE81-028552		p0014	N82-11646 #		DE81-029882		p0081	N82-15575 #	ŧ
DE81-028567		p0116	N82-14680 #		DE81-029883				•
DE81-028569	***************************************			- I	DE81-029901	***************************************			
DE81-028570		20024	N82-13523 #	l	DE81-029910				
DE81-028580					DE81-029912				
	••••••			- 1		•••••			
DE81-028581	•••••			- 1	DE81-029943	••••			
DE81-028582	***************************************			- 1	DE81-029951	•••••			ř
DE81-028609		p0023	N82-13392 #	- 1	DE81-029952				
DE81-028642				- 1	DE81-029956	• • • • • • • • • • • • • • • • • • • •	p0028	N82-14664 #	ŧ
DE81-028650		p0018	N82-12581 #	l	DE81-029958		p0101	N82-11246 #	ŧ
DE81-028653					DE81-029987		p0010	N82-11245 #	ł
DE81-028678		p0155	N82-10525 #		DE81-029989				
DE81-028689		p0032	N82-15602 #	ı	DE81-029991		p0028	N82-14650 #	ŀ
DE81-028703				ł	DE81-029993		n0021	NR 2-12671 4	B
DE81-028731									
	•••••			ı	DE81-029994	•••••			
DE81-028734	•••••			1	DE81-029995	••••			
DE81-028735				ı	DE81-029999	•••••			
DE81-028778	•••••	pu065	N82-10538 #	ı	DB81-030002	***************************************			
DE81-028783	•••••	p0011	N82-11320 #	1	DE81-030008	•••••			
DE81-028797		p0070	N82-11606 #	- 1	DE81-030036				
DE81-028852	*******************	p0065	N82-10541 #	- 1	DE81-030039		p0119	N82-15604 #	ŧ
DE81-028867				1	DE81-030053				
DE81-028873	***************************************			1	DE81-030054				
DE81-028896	***************************************				DE81-030073	***************************************			
DE81-028899				l i	DE81-030075	***************************************			
DE81-028916				- 1	DE81-030075				
	••••••					•••••			
DE81-028921	•••••			- 1	DE81-030085	••••			
DE81-028930	•••••			- 1	DE81-030091	•••••	p0138	N82-11045	ŧ
DE81-028935	******************			ı	DE81-030096	•••••	p0033	N82-15613 #	Ė
DE81-028971		p0065	N82-10543 #	- 1	DE81-030099	•••••	p0160	N82-15510 #	ŧ
DE81-028975				- 1	DE81-030100	***************************************	p0097	N82-10655 #	ŧ
DE81-028995				ı	DB81-030103	***************************************	p0160	N82-15548 #	2
DE81-029028				ı	DE81-030129	•••••	D0138	N82-11044	į
DE81-029037				- 1	DE81-030123		20.00	NR 2-11110 4	4
DE81-029071				ı			P0030	NO2-44005	•
	•••••	P0014	NO2-11041 #	ı	DE81-030158	••••	PO 100	NO2-11235 #	f
DE81-029072	•••••	PU 110	moz=12033 #	- 1	DE81-030166	•••••	pu 140	m82-12590 #	•
DE81-029073	•••••			ı	DE81-030178	•••••			
DE81-029088	•••••			ı	DE81-030183	• • • • • • • • • • • • • • • • • • • •			
DE81-029095	***************************************			ı	DE81-030184	• • • • • • • • • • • • • • • • • • • •	p0102	N82-11254 #	ŧ
DE81-029123	•••••			- 1	DE81-030192	•••••	8000q	N82-10590 #	ŧ
DE81-029125				Ì	DE81-030194	***************************************	p0118	N82-15509 #	•
DE81-029134		p0093	N82-10154 #	- 1	DE81-030198		p0101	N82-11244 #	ŧ
	•••••				DE81-030219		p0093	N82-10153 #	ł
DE81-029137				•	· · -				

DB81-030220		n0072	NR2-12600 4		DE81-0279446	50007	NO2-10020 4
DE81-030221					DE81-0279446		
DB81-030226		E0008	N82-10585	_	DE82-000004		
DB81-030235		p0082	N82-15581	-			
DE81-030239							
					DE82-000038		
DE81-030262					DE82-000067		
DE81-030272	•••••				DE82-000068		
DB81-030273	•••••				DE82-000071		
DE81-030279	•••••				DB82-000091		
DE81-030288	•••••			•	DE82-000098	p0019	N82-12621 #
DB81-030369				•	DE82-000116	p0110	N82-12584 #
DE81-030310					DE82-000133	p0018	N82-12583 #
DB81-030312		p0081	N82-15569		DE82-000169		
DB81-030319		p0017	N82-12513		DE82-000227	p0109	N82-12523 #
DE81-030329		p0033	N82-15608	•	DE82-000236		
DB81-030340				* 1	DE82-000238		
DE81-030353					DE82-000251		
DE81-030356				.	DE82-000284		
DB81-030363				: I	DE82-000288	-	
DE81-030370					DE82-000432		
DE81-030391				.			
DE81-030422				.	DE82-000452		
				: 1	DE82-000461		
DE81-030425				•	DE82-000464		
DB81-030441				•	DB82-000466		
DE81-030470				.	DB82-000482		
DE81-030485	•••••			•	DE82-000501		
DE81-030487	•••••			•	DE82-000508		
DE81-030492	•••••			•]	DE82-000523		
DE81-030497	•••••			•	DE82-000525		
DE81-030546				#	DE82-000529	p0109	N82-12516 #
DE81-030622				#	DE82-000698		
DE81-030629		p0117	N82-15222	•	DE82-000705		
DE81-030634		p0103	N82-11267	•	DE82-000744		
DE81-030669					DE82-000808		
DE81-030671					DE82-000811		
DE81-030672					DE82-000873		
DE81-030673		p0158	N82-11620		DE82-000910		
DE81-030705	•••••				DE82-000935		
DE81-030740					DE82-000941		
DE81-030822	***************************************				DE82-000956		
DE81-030841		D0020	N82-12667		DE82-000964		
DE81-030845							
DE81-030857							
DB81-030860							
DE81-030883				. 1	DE82-001151		
DB81-030887				:			
DE81-030895							
DE81-030950					DE82-900206		
DE81-030954				:	DE82-900207 DE82-900208		
DE81-030975							
DE81-030981				- 1	DE82-900316	P0025	B02-13339 #
DE81-030982		20000	NO 2-11566		DFVLR-FB-81-07	-0126	1102-10#E2 A
DE81-030986				<u>.</u>	DEADWard-01-01	ρυ 130	MOZ-10432 #
DE81-031000					DFVLR-MITT-81-10	~^^0	100-155#0 #
DE81-031920					DIATE HITT-01-10	poods	NO2-13342 F
DE81-031921					DGE/AF-92005/T1	-0100	W02-11225 A
DE81-031923				:			
DE81-031932				:			
				.	DOE/BETC/OR-19	P0096	NO2-104/0 #
DE81-031934		P0072	NO2-12002 1		DOE/BETC/PPS-81/3		
DE81-031937	•••••				DOE/BETC/QPR-80/4	P0094	NO2-10250 #
DE81-031974	•••••				DOE/BP-58		
DE81-032019	•••••			<u>.</u>	DOE/BP-60		
DE81-032024	•••••			.	DOE/CE-0016	p0031	N82-15554 #
DE81-769341	•••••				DCE/CS-4042/2	pu077	N82-13531 #
DE81-769452	•••••				DOE/CS-10045/T3		
DB81-769704	••••				DOE/CS-12077/T1		
DB81-769734					DOE/CS-20057/T4		
DE81-769737					DOE/CS-20057/T5		
DB81-803762					DOE/CS-20074/1		
DE81-901931	***************************************			*	DOE/CS-20231/1		
DE81-903377				!	DOE/CS-20240/1	p0028	N82-14659 #
DE81-903429					DOE/CS-20300/3		
DE81-903760)	DOE/CS-20424/1		
DE81-903763				}	DOE/CS-30259/6		
DE81-903764				•	DOE/CS-30292/3		
DE81-903765		p0142	N82-13515 #	!	DOE/CS-40037/T2		
DE81-903785		p0114	N82-14380 4	; [DOE/CS-40259/1		
DE81-904010		p0027	N82-14398 #	• i	DOE/CS-50023/T15		
DE81-904014		p0104	N82-11520 4	•	DOE/CS-50141/T1		
DE81-904016				†	DOE/CS-83004/3		
DE81-904192					DCE/DP-00789/T15		
DE81-904212		p0019	N82-12593 #	•	DOE/EIA-0272		
DE81-904220	•••••	p0018	N82-12580 #	•	DOE/EIA-0293	p0018	N82-12526 #
DE81-904231	***************************************	p0141	N82-12592 #	;	DOE/EIA-0297		
DE81-904234		p0107	N82-12251 #	;	DOE/EIS-0073-VOL-1		
DE81-904236		p0019	N82-12594 4		DCF/EP-0022		
DE81-904237		p0035	N82-16013 4	:]	DCE/EP-0026		
DE81-904245		p0 136	N82-10406 #	,	DOE/EP-0028		
DE81-904246		p0035	N82-16012 #	; ;	DCE/EP-0029	p0029	N82-14900 #

```
      DOE/EP-10004/1
      p0027 N82-14644 #

      DOE/ER-04169/T1
      p0023 N82-13192 #

      DOE/ER-10044/T1
      p0028 N82-14648 #

        DOE/ER-04169/T1
        p0023 N82-13192

        DOE/ER-10044/T1
        F0028 N82-14648

        DOE/ER-10558/2
        p0064 N82-10521

        DOE/ER-30010/1
        p0010 N82-11249

        DOE/ET-5047/1
        p0155 N82-10527

        DOE/ET-5047/2
        p0156 N82-10528

        DOE/ET-5047/5
        p0156 N82-10529

        DOE/ET-5047/9D
        p0156 N82-10529

        DOE/ET-5047/12
        p0157 N82-10574

        DOE/ET-10104/12
        p0157 N82-10574

        DOE/ET-10145/72
        p0118 N82-15508

        DOE/ET-10152/T6
        p00694 N82-10260

        DOE/ET-10204/T1
        p0112 N82-13248

        DOE/ET-10325/T11
        p0092 N82-10151

        DOE/ET-10381/197
        p0105 N82-12182

        DOE/ET-10445/1
        p0092 N82-10141

        DOE/ET-10517/T1
        p0092 N82-10141

        DOE/ET-10593/T2
        p0106 N82-12198

        DOE/ET-10785/T1
        p0143 N82-13926

        DOE/ET-10805/T1-VOL-1
        p0139 N82-11947

                                                                                                                p0076 N82-13495*#
p0068 N82-11550*#
                                                                                                                  DOE/JPL-1060-41
                                                                                                                  DCE/JPL-1060-43
DOE/JPL-1060-49
DOE/PC-30098/T2
DOE/PC-30141/T4
                                                                                                                                                p0010 N82-1239
p0106 N82-12194
p0106 N82-12196
                                                                                                                 p0095 N82-10269
p0072 N82-12598
                                                                                                                                                                                                N82-10269
  DOE/FE-20219/2
                                ..... p0 107 N82-12254
                                                                                                                  DOE/TIC-1028580
                                                                                                                                                 p0146
  DOE/FE-50135/2
                                ----- p0101 N82-11238
                                                                                                                  DOE/TIC-1028678
                                                                                                                                                 p0155 N82-10525
```

DOT-HS-805833 p0026 N82-13985 #			
	EPEI-EM-1589-VOL-1	n0155 N82-1052	7 ±
DOT-HS-805873	EPRI-EM-1589-VOL-2		
DOT-HS-805895	EPRI-EB-1589-VOL-3		
DOT-HS-805903	EPRI-EM-1589-VOL-5		
DOT-HS-805904	EPRI-EM-1589-VOL-8		
	DPRI -ER-1500 FOX - 0 - 10D-0	PUIDO NOZ-11020	4 4
DOT-HS-805905 p0022 N82-13020 #	EPRI-EM-1589-VOL-9-APP-C		
70000 000 0000	BPBI-EM-1589-VOL-9-APP-D		
DOT-TSC-NHTSA-81-6 p0023 N82-13435 #	EPRI-EM-1589-VOL-12	P0157 N82-1057	4 #
DOT-TSC-NHTSA-81-8 p0030 N82-15453 #	EPRI-RM-1591		
DOT-TSC-BHTSA-81-13 p0026 N82-13985 #	EPRI-EM-1968-VOL-1		
DOT-TSC-NHTSA-81-18 p0026 N82-13986 #	EPRI-EM-1968-VOL-2	p0019 N82-1259	4 #
DP-81/935 p0118 N82-15452 #	EPRI-NP-1824	p0096 N82-1027	5 🛊
_	t .		
DTNSRDC/SME-80/46	BPRI-TPS-79-750	p0072 N82-1257	8 #
		•	
DYNATECH-2115 p0101 N82-11243 #	EPRI-WS-80-132	n0103 N82-1126	1 #
Zianizati zita	EPEI-WS-80-136	DO142 NR2-1351	5 4
E-621 p0103 N82-11397*#	1111 #5 00 150	PU 142 BUZ 1351.	•
E-871	ERG-035	D0027 N82-1062	6 #
B-922	DDG-033	POUZ / HOZ-1402	
B-991 p0155 N82-10503+#	EES-E-276	-0007 NO. 1073	E A
E-1025pC159 N82-12574+#	EB5-E-2/0	PO031 B02-1013	5 #
	RSA-CR(P)-1462-VOL-1	-0464 700 4400	
E-1057 p0141 N82-12943**	KSA-CR(P)-1462-VOL-1	PU 101 N82-1498	I #

EE.5E.81 p0015 N82-11654 #	ESD-78-MSFC-2174	PUUO/ N82-1154	나무 중
EEB-VENT-81-17 p0033 N82-15611 #	ESG-DOE-13363	p0094 N82-1025	1 #
			_
EGG-GTH-5474 p0093 N82-10201 #	EUR-6758-EN	p0019 N82-1259	7 #
EGG-H-02781	B82-10010	p0030 N82-1548	8*#
BGG-N-03381p0141 N82-12634 #	E82-10011		
-		-	•
EGG-2113	FAA-EM-81-10	D0027 N82-1407	1 #
		• • • • • • • • • • • • • • • • • • • •	
END-81-27 p0023 N82-13255 #	FBNML-NAS-E-2	DO143 N82-1452	0 #
EMD-81-64 p0107 N82-12242 #			
, or the second	FCR-3463	n0143 N82-1464	2 ±
EPA-AA-SDSB-81-4	108-3403	P0143 M02 1404.	- *
EPA-AA-SDSB-81-01 p0034 N82-15621 #	PE-1540-29-VOL-1	-0120 NO2-1105	7 4
EPA-BA-SUSB-0 (-VI pvV34 R02-13021 \$			
773 AA M77 544 04 7	FE-1545-89		
EPA-AA-TEB-511-81-7 p0013 N82-11480 #	FB-2018-19		
EPA-AA-TEB-511-81-10A	FE-2034-23		
EPA-AA-TEB-511-81-10B p0012 N82-11479 #	FE-2706-43		
	PE-10152-65	P0094 N82-1026	0 #
EPA-460/3-81-010p0118 N82-15452 #		•	
EPA-600/2-81-149	FFA-134	p0140 N82-1253	7 #
EPA-600/2-81-155			
EPA-600/4-01-034 p0009 N82-10605 #	FHWA/CT-80/12	p0023 N82-1326	7 #
EPA-600/4-81-052 p0015 N82-11671 #	•		
EPA-600/7-81-012C p0015 N82-11679 #	GDC-AST-81-019-VOL-2	p0078 N82-1463	7*#
EPA-600/7-81-039	•		
EPA-600/7-81-086	GRI-79-0100	p0095 N82-1027	2 #
EPA-600/7-81-096 p0015 N82-11661 #	GRI-79/0108	p0087 N82-1523	1 #
EPA-600/7-81-098 p0011 N82-11273 #	GRI-80/0013.1	D0015 N82-1165	7 #
EPA-600/7-81-101p0026 N82-13576 #	GRI-80/0013.2		
EPA-600/7-81-133	GRI-80/0031		
EPA-600/7-81-138		p0011 N82-1127	4 #
	GRI-80/0033	p0011 N82-1127	4 #
EPA-600/7-81-140 p0034 N82-15626 #	GBI-80/0033	p0011 N82-1127	4 #
EPA-600/7-81-140	GBI-80/0033	p0011 N82-1127 p0118 N82-1523 p0103 N82-1127 p0139 N82-1147	4 # 2 # 1 # 8 #
	GRI-80/0033 GRI-80/0053 GULF-627RM073	p0011 N82-1127 p0118 N82-1523 p0103 N82-1127 p0139 N82-1147	4 # 2 # 1 # 8 #
EPA-600/7-81-146	GBI-80/0033	p0011 N82-1127 p0118 N82-1523 p0103 N82-1127 p0139 N82-1147	4 # 2 # 1 # 8 #
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073	p0011 N82-1127 p0118 N82-1523 p0103 N82-1127 p0139 N82-1147 p0101 N82-1124	4 # 2 # 1 # 8 # 2 #
EPA-600/7-81-146	GBI-80/0033	p0011 N82-1127 p0118 N82-1523 p0103 N82-1127 p0139 N82-1147 p0101 N82-1124	4 # 2 # 1 # 8 # 2 #
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073	p0011 N82-1127- p0118 N82-1523- p0103 N82-1127- p0139 N82-1147- p0101 N82-1147- p0080 N82-1553	4 # 2 # 8 # 2 # 0 #
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073	p0011 N82-1127- p0118 N82-1523- p0103 N82-1127- p0139 N82-1147- p0101 N82-1147- p0080 N82-1553	4 # 2 # 8 # 2 # 0 #
EPA-600/7-81-146	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097	p0011 N82-1127- p0118 N82-1523- p0103 N82-1127- p0103 N82-1147- p0101 N82-1124- p0080 N82-1553- p0155 N82-1052	4 # # 2 # # 2 # 5 #
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073	p0011 N82-1127- p0118 N82-1523- p0103 N82-1127- p0103 N82-1147- p0101 N82-1124- p0080 N82-1553- p0155 N82-1052	4 # # 2 # # 2 # 5 #
EPA-600/7-81-146	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IEBL-RTP-1244	p0011 N82-1127- p0118 N82-1523- p0103 N82-1127- p0139 N82-1147- p0101 N82-1147- p0080 N82-1553- p0155 N82-1052- p0034 N82-1561-	4 # # 2 # # 8 # 2 # # 5 # # 8
EPA-600/7-81-146	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097	p0011 N82-1127- p0118 N82-1523- p0103 N82-1127- p0139 N82-1147- p0101 N82-1147- p0080 N82-1553- p0155 N82-1052- p0034 N82-1561-	4 # # 2 # # 8 # 2 # # 5 # # 8
EPA-600/7-81-146 p0034 N82-15618 # EPA-600/9-81-006 p0034 N82-15631 # EPA-600/9-81-019A-VOL-1 p0035 N82-15651 # EPA-600/9-81-019B p0035 N82-15652 # EPA/460-3-81-015 p0118 N82-15233 # EPRI-AP-1882-VOL-2 p0094 N82-10253 # EPRI-AP-1882-VOL-3 p0096 N82-10254 # EPRI-AP-1889-VOL-1 p0136 N82-10264 # EPRI-AP-1932 p0114 N82-14380 #	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96	P0011 N82-1127- P0118 N82-1523- P0103 N82-1127- P0103 N82-1147- P0101 N82-1124- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060-	4 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
EPA-600/7-81-146 p0034 N82-15618 # EPA-600/9-81-006 p0034 N82-15623 # EPA-600/9-81-019A-VOL-1 p0035 N82-15651 # EPA-600/9-81-019B p0035 N82-15652 # EPA/460-3-81-015 p0118 N82-15652 # EPA/460-3-81-015 p0118 N82-15233 # EPRI-AP-1882-VOL-2 p0094 N82-10253 # EPRI-AP-1882-VOL-3 p0006 N82-10254 # EPRI-AP-1889-VOL-1 p0136 N82-10406 # EPRI-AP-1932 p0144 N82-14380 # EPRI-AP-1940 p0064 N82-10515 #	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IEBL-RTP-1244 IL/SGS/EGN-96 IS-M-321	P0011 N82-1127- P0118 N82-1523- P0103 N82-1127- P0139 N82-1147- P0101 N82-1147- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060- P0002 N82-1319-	4 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
EPA-600/7-81-146 p0034 N82-15618 # EPA-600/9-81-006 p0034 N82-15633 # EPA-600/9-81-019A-VOL-1 p0035 N82-15651 # EPA-600/9-81-019B p0035 N82-15652 # EPA/460-3-81-015 p0118 N82-15652 # EPA/460-3-81-015 p0118 N82-15233 # EPRI-AP-1882-VOL-2 p0094 N82-10253 # EPRI-AP-1882-VOL-3 p0006 N82-10254 # EPRI-AP-1889-VOL-1 p0136 N82-10406 # EPRI-AP-1932 p014 N82-14380 # EPRI-AP-1940 p0064 N82-10515 # EPRI-AP-1959 p0064 N82-10524 #	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96	P0011 N82-1127- P0118 N82-1523- P0103 N82-1127- P0139 N82-1147- P0101 N82-1147- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060- P0002 N82-1319-	4 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
EPA-600/7-81-146	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345	P0011 N82-1127- P0118 N82-1523- P0103 N82-1127- P0103 N82-1147- P0101 N82-1124- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060- P0022 N82-1319- P0160 N82-1557-	4218
EPA-600/7-81-146 p0034 N82-15618 # EPA-600/9-81-006 p0034 N82-15633 # EPA-600/9-81-019A-VOL-1 p0035 N82-15651 # EPA-600/9-81-019B p0035 N82-15652 # EPA/460-3-81-015 p0118 N82-15652 # EPA/460-3-81-015 p0118 N82-15233 # EPRI-AP-1882-VOL-2 p0094 N82-10253 # EPRI-AP-1882-VOL-3 p0006 N82-10254 # EPRI-AP-1889-VOL-1 p0136 N82-10406 # EPRI-AP-1932 p014 N82-14380 # EPRI-AP-1940 p0064 N82-10515 # EPRI-AP-1959 p0064 N82-10524 #	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IEBL-RTP-1244 IL/SGS/EGN-96 IS-M-321	P0011 N82-1127- P0118 N82-1523- P0103 N82-1127- P0103 N82-1147- P0101 N82-1124- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060- P0022 N82-1319- P0160 N82-1557-	4218
EPA-600/7-81-146	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IEBL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-4767	p0011 N82-1127- p0118 N82-1523- p0103 N82-1127- p0139 N82-1147- p0101 N82-1147- p0080 N82-1553- p0155 N82-1052- p0034 N82-1561- p0009 N82-1561- p00022 N82-1319- p0161 N82-11012-	4218
EPA-600/7-81-146	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IEBL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-M-767 ISBN-0-7743-6072-0	p0011 N82-1127- p0118 N82-1523- p0103 N82-1127- p0139 N82-1147- p0101 N82-1147- p0080 N82-1553- p0155 N82-1052- p0034 N82-1561- p0009 N82-1561- p0002 N82-1319- p0161 N82-1101- p0007 N82-1101- p0007 N82-1439-	4218 2 0 5 8 8 19 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
EPA-600/7-81-146	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IEBL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-4767	p0011 N82-1127- p0118 N82-1523- p0103 N82-1127- p0139 N82-1147- p0101 N82-1147- p0080 N82-1553- p0155 N82-1052- p0034 N82-1561- p0009 N82-1561- p0002 N82-1319- p0161 N82-1101- p0007 N82-1101- p0007 N82-1439-	4218 2 0 5 8 8 19 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDC-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-4767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9	P0011 N82-1127- P0118 N82-1523- P0103 N82-1127- P0109 N82-1147- P0101 N82-1124- P0080 N82-1553- P0155 N82-1052- P0034 N82-15614- P0009 N82-1060- P0022 N82-1319- P0161 N82-11012- P0027 N82-1439- P0075 N82-1264-	4218 2 0 5 8 8 19 2 8 4 8 4 5 5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-H-321 IS-H-345 IS-4767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0171-7618	P0011 N82-1127- P0118 N82-1523- P0103 N82-1147- P0101 N82-1147- P0101 N82-1147- P0101 N82-1147- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060- P0022 N82-1319- P0161 N82-1101- P0027 N82-1439- P0075 N82-1264- P0096 N82-1027-	4218 2 0 5 8 8 19 2 8 4 9 **
EPA-600/7-81-146	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IEBL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-M-767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0171-7618 ISSN-0340-7608	P0011 N82-1127: P0118 N82-1523: P0103 N82-1147: P0101 N82-1124: P0080 N82-1553: P0155 N82-1052: P0034 N82-1561: P0009 N82-1561: P0009 N82-1557: P0161 N82-1101: P0027 N82-1264: P0096 N82-1027: P0096 N82-1027: P0097 N82-1048:	4218 2 0 5 8 8 19 2 84 92
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-M-345 IS-4767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0171-7618 ISSN-0340-7608 ISSN-0340-7608	P0011 N82-1127- P0118 N82-1523- P0103 N82-1127- P0103 N82-1147- P0101 N82-1124- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1561- P0009 N82-1557- P0161 N82-1101- P0027 N82-1264- P0096 N82-1264- P0096 N82-1027- P0097 N82-1048- P0096 N82-1057-	4218 2 0 5 8 8 19 2 84 921
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDC-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-4767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0171-7618 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608	P0011 N82-1127- P0118 N82-1523- P0103 N82-1147- P0101 N82-1147- P0101 N82-1124- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060- P0022 N82-1319- P0161 N82-1101- P0027 N82-1439- P0075 N82-1264- P0096 N82-1048- P0096 N82-1048- P0096 N82-1057- P0008 N82-1057-	4218 2 0 5 8 8 19 2 84 9212 ###################################
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-H-321 IS-H-345 IS-H-345 IS-H-345 IS-H-367 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0171-7618 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608	P0011 N82-1127- P0118 N82-1523- P0103 N82-1147- P0101 N82-1147- P0101 N82-1147- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060- P0022 N82-1319- P0161 N82-1101- P0027 N82-1439- P0075 N82-1264- P0096 N82-1264- P0096 N82-1057- P0008 N82-1057- P0008 N82-1057- P00016 N82-1220-	4218 2 0 5 8 8 19 2 84 92124 ###################################
EPA-600/7-81-146	GBI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-M-345 IS-4767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608	PO011 N82-1127- PO118 N82-1523- PO139 N82-1147- PO101 N82-1124- PO080 N82-1553- PO155 N82-1052- PO034 N82-1561- PO009 N82-1060- PO022 N82-1319- PO161 N82-1557- PO161 N82-1101- PO07 N82-1264- PO096 N82-1057- PO096 N82-1048- PO096 N82-1057-	4218 2 0 5 8 8 19 2 84 921245 ####################################
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-M-345 IS-4767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608	P0011 N82-1127- P0118 N82-1523- P0103 N82-1147- P0101 N82-1147- P0101 N82-1124- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1561- P0009 N82-1561- P0007 N82-157- P0161 N82-1101- P0027 N82-1264- P0096 N82-1264- P0096 N82-1057- P0096 N82-1048- P0096 N82-1220- P0016 N82-1220- P0016 N82-1220-	4218 2 0 5 8 8 19 2 84 9212456 ##### # # # # # # # # ###############
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-H-321 IS-H-345 IS-4767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0340-7608	P0011 N82-1127- P0118 N82-1523- P0103 N82-1147- P0101 N82-1147- P0101 N82-1124- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060- P0022 N82-1319- P0161 N82-1101- P0027 N82-1439- P0075 N82-1439- P0076 N82-1048- P0096 N82-1048- P0096 N82-1047- P0098 N82-1048- P0098 N82-1048- P0098 N82-1048- P0098 N82-1220- P0016 N82-1220-	4218 2 0 5 8 8 19 2 84 92124563
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-M-321 IS-M-345 IS-M-345 IS-4767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608 ISSN-0340-7608	P0011 N82-1127- P0118 N82-1523- P0103 N82-1147- P0101 N82-1147- P0101 N82-1124- P0080 N82-1553- P0155 N82-1052- P0034 N82-1561- P0009 N82-1060- P0022 N82-1319- P0161 N82-1101- P0027 N82-1439- P0075 N82-1439- P0076 N82-1048- P0096 N82-1048- P0096 N82-1047- P0098 N82-1048- P0098 N82-1048- P0098 N82-1048- P0098 N82-1220- P0016 N82-1220-	4218 2 0 5 8 8 19 2 84 92124563
EPA-600/7-81-146	GRI-80/0033 GRI-80/0053 GRI-80/0053 GULF-627RM073 IAT-BS-100000-010 IDO-10097 IERL-RTP-1244 IL/SGS/EGN-96 IS-H-321 IS-H-345 IS-4767 ISBN-0-7743-6072-0 ISBN-951-38-1199-9 ISSN-0340-7608	P0011 N82-1127: P0118 N82-1523: P0139 N82-1147: P0101 N82-1124: P0080 N82-1553: P0155 N82-1052: P0034 N82-1557: P0161 N82-1557: P0161 N82-1101: P0027 N82-1319: P0097 N82-1264: P0096 N82-1264: P0097 N82-1264: P0096 N82-1220: P0016 N82-1220: P0017 N82-1240: P0017 N82-1240: P0017 N82-1240:	4218 2 0 5 8 8 19 2 8 4 9 2 1 2 4 5 6 3 4 8 # # # # # # # # # # # # # # # # # #

	32-12642 # LBI-13063p0	0033 NR2-15607 #
ISSN-0340-7608	32-13547 #	
ISSN-0340-7608 p0143 N8		0030 N82-15488*#
ISSN-0340-7608 p0150 N8	92-15134 #	
ISSN-0340-7608p0029 N8	32-15142 # LMF-85	0014 N82-11651 #
ISSN-0340-7608 p0030 N8	32-15168 #	
ISSN-0340-7608 p0030 N8		0100 N82-11224*#
ISSN-0340-7608 pcc80 N8		
ISSN-0340-7608 poc80 N8		
ISSN-0340-7608		
ISSN-0340-7608		
ISSN-0340-7608 p0C80 N8		00/9 N82-14661 #
ISSN-0340-7608 p0080 N8 ISSN-0340-7608 p0032 N8		0067 NO2-11216 #
ISSN-0340-7608		7007 802-11310 #
1SSN-0340-7608		0062 NB2-10276 #
ISSN-0355-3469		7002 NOZ-10270 V
100 C1004	MASEC/R-81-005	019 N82-12608 #
JHU/APL/EQR/81-1 p0013 H8		
,,,	MASEC/R-81-068p0	
JPL-PUB-81-16 p0066 N8		073 N82-12612 #
JPL-PUB-81-23 p0076 N8		
JPL-FUB-81-27 p0068 N8		066 N82-10571 #
JPL-POB-81-41 p0024 N8		
JPL-PUB-81-45 p0098 N8		032 N82-15594 #
JPL-PUB-81-74 p0104 N8		
JPL-PUB-81-75 p0016 N8		0007 N82-10514 #
JPL-PUB-81-76 p0067 N8		073 N82-12610 #
JPL-PUB-81-82 p0098 N8.	32-11145*# HIT-EL-81-011 p0(0006 N82-10334 #
JPL-PUB-81-83 p0026 N8		073 N82-12609 #
JPL-PUB-81-85 p0G68 N8	32-11549*#	
JPL-PUB-81-89 p0076 N8		095 N82-10268 #
JPL-PUB-81-91 p0C76 N8	32-13491##	
JPL-FUB-81-100 p0142 N8	22-13386*# MR-14 p00	1072 N82-12602 #
1D1 0050 E60	10 40(F0+# UPO D3 0##	
JPL-9950-569		0081 N82-15551 #
JPL-9950-570		1000 NOO 106E7+4
JPL-9950-597		1020 N62-12657+#
JPL-9950-604		1010 NR2-11626 #
JPL-9950-607 p0C78 N8		014 802-11020
JPL-9950-611		0032 N82-15589 #
and a second a second and a second a second and a second a second and a second and a second a second a second	MTR-80W602-VOL-2 p00	
JSC-16759p0030 N8.		
	NASA-CASE-LEW-12950-1	139 N82-11399*#
L-14766 p0150 N8.	12-14202*#	
2 14700 ===================================		
	NASA-CASE-NPO-14273-1 p00	097 N82-11144*
LA-UR-81-852	NASA-CASE-NPO-14273-1	107 N82-12240*#
LA-UR-81-852	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*#
LA-UR-81-852	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1063 N82-10496*#
LA-UR-81-852	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*# 107 N82-12241*#
LA-UR-81-852 pCC57 N8. LA-UR-81-1054 p138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*# 107 N82-12241*#
LA-UR-81-852 pCC57 N8. LA-UR-81-1054 pC 138 N8. LA-UR-81-1265 pC 197 N8. LA-UR-81-1750 p0 139 N8. LA-UR-81-1806 p0 119 N8. LA-UR-81-1807 p0 119 N8.	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*# 10107 N82-12241*# 10159 N82-12445*# 10159 N82-15488*#
LA-UR-81-852 pCC57 N8. LA-UR-81-1054 p138 N8 LA-UR-81-1265 pCC97 N8. LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8. LA-UR-81-1807 p0119 N8. LA-UR-81-1906 pCC86 N8	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-12445*# 1030 N82-15488*# 1063 N82-10501*#
LA-UR-81-852	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*# 107 N82-12241*# 1059 N82-12245*# 1030 N82-12445*# 1063 N82-10501*# 1063 N82-10502*#
LA-UR-81-852	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-12445*# 1030 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*#
LA-UR-81-852	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-12445*# 1030 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10502*# 1063 N82-11544*#
LA-UR-81-852	NASA-CASE-NPO-14273-1	1107 N82-1240*# 1063 N82-10496*# 1107 N82-1241*# 1159 N82-12445*# 1063 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 10663 N82-10504*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 F0138 N8 LA-UR-81-1265 pCG97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-2186 p0070 N8 LA-UR-81-2200 p0074 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8	NASA-CASE-NPO-14273-1	107 N82-1240*# 1063 N82-10496*# 1107 N82-1244*# 1159 N82-12445*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-10504*# 1063 N82-1548*# 1067 N82-1548*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-2106 pC686 N8 LA-UR-81-2162 p065 N8 LA-UR-81-2185 p065 N8 LA-UR-81-22186 p0670 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-12241*# 1159 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-10504*# 1063 N82-10504*# 1066 N82-11544*# 1067 N82-15489*# 1067 N82-1146*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p065 N8 LA-UR-81-2186 p0C70 N8 LA-UR-81-2200 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0073 N8 LA-UR-81-2365 p0150 N8	NASA-CASE-NPO-14273-1	1107 N82-1240*# 1063 N82-10496*# 1107 N82-1241*# 1159 N82-12445*# 1063 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 10663 N82-11544*# 10663 N82-11548*# 1067 N82-11548*# 1067 N82-11548*# 1067 N82-11548*# 1068 N82-11548*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCG97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0C65 N8 LA-UR-81-2186 p0C70 N8 LA-UR-81-2200 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2258 p0073 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0150 N8	NASA-CASE-NPO-14273-1	107 N82-1240*# 1063 N82-10496*# 1107 N82-1244*# 1109 N82-12445*# 1030 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-10504*# 1064 N82-11544*# 1067 N82-11548** 1068 N82-11548*# 1098 N82-11548*#
LA-UR-81-852 LA-UR-81-1054 LA-UR-81-1265 LA-UR-81-1750 LA-UR-81-1806 LA-UR-81-1807 LA-UR-81-1807 LA-UR-81-2185 LA-UR-81-2185 LA-UR-81-2185 LA-UR-81-2251 LA-UR-81-2252 LA-UR-81-2258 LA-UR-81-2258 LA-UR-81-2288 LA-UR-81-2380 LA-UR-81-2380 LA-UR-81-2380 LA-UR-81-2380 LA-UR-81-2595 P0148 N8 P0159 N8 P0070 N8	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-10504*# 1065 N82-11544*# 1011 N82-11548*# 1067 N82-11548*# 1068 N82-11548*# 1068 N82-11548*# 1069 N82-11548*# 1068 N82-11548*# 1068 N82-11548*# 1069 N82-11994*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCG97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0C65 N8 LA-UR-81-2186 p0C70 N8 LA-UR-81-2200 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2258 p0073 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0150 N8	NASA-CASE-NPO-14273-1 p00 12-10480	1107 N82-1240*# 1063 N82-10496*# 1107 N82-1241*# 1159 N82-12445*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-10504*# 1063 N82-10504*# 1063 N82-10500*# 1018 N82-15489*# 1067 N82-11548*# 1068 N82-11548*# 1068 N82-11549*# 1068 N82-11145*# 1068 N82-11145*# 1016 N82-11199*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCG97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0C65 N8 LA-UR-81-2286 p0C70 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0070 N8 LA-UR-81-2365 p0070 N8 LA-UR-81-2365 p0073 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2365 p0144 N8 LA-UR-81-2595 p0 144 N8 LA-UR-81-2628 pC682 N8	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-12241*# 1059 N82-15488*# 1063 N82-10502*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-11544*# 1066 N82-11548*# 1018 N82-15489*# 1066 N82-11146*# 1098 N82-11146*# 1098 N82-11145*# 1016 N82-111994*# 1016 N82-1159*# 1016 N82-1159*#
LA-UR-81-852 LA-UR-81-1054 LA-UR-81-1265 LA-UR-81-1750 LA-UR-81-1806 LA-UR-81-1806 LA-UR-81-1807 LA-UR-81-1807 LA-UR-81-1806 LA-UR-81-2162 LA-UR-81-2162 LA-UR-81-2165 LA-UR-81-2185 LA-UR-81-2185 LA-UR-81-2251 LA-UR-81-2251 LA-UR-81-2252 LA-UR-81-2252 LA-UR-81-2365 LA-UR-81-2380 LA-UR-81-2380 LA-UR-81-2595 LA-UR-81-2528 LA-UR-81-2595 LA-UR-81-2628 LA-UR-81-2528 LA-UR-81-2595 LA-UR-81-2628	NASA-CASE-NPO-14273-1	107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-12445*# 1030 N82-1248** 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10500*# 1063 N82-10500*# 1063 N82-10500*# 1018 N82-11544*# 1066 N82-11548*# 1098 N82-11548*# 1098 N82-11146** 1098 N82-11145** 1016 N82-11994*# 1016 N82-11299** 1066 N82-11299** 1066 N82-1150** 1068 N82-11550*#
LA-UR-81-852	NASA-CASE-NPO-14273-1 p00 12-10480	1107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-10504*# 10663 N82-11544*# 1067 N82-11548*# 1067 N82-11548*# 1068 N82-11548*# 1068 N82-11549*# 1068 N82-11549*# 1068 N82-11549*# 1068 N82-11549*# 1016 N82-11548*# 1016 N82-11548*# 1016 N82-1156*# 1018 N82-1150*#
LA-UR-81-852 LA-UR-81-1054 LA-UR-81-1265 LA-UR-81-1750 LA-UR-81-1806 LA-UR-81-1807 LA-UR-81-1807 LA-UR-81-1906 LA-UR-81-2162 LA-UR-81-2162 LA-UR-81-2185 LA-UR-81-2185 LA-UR-81-2251 LA-UR-81-2251 LA-UR-81-2252 LA-UR-81-2252 LA-UR-81-2252 LA-UR-81-2253 LA-UR-81-2253 LA-UR-81-2254 LA-UR-81-2255 LA-UR-81-2255 LA-UR-81-2258 LA-UR-81-2258 LA-UR-81-2259 LA-UR-81-2259 LA-UR-81-2259 LA-UR-81-2259 LA-UR-81-2259 LA-UR-81-2268 LA-UR-81-2268 LA-UR-81-2268 LA-UR-81-2628 LA-B906-MS LA-B906-MS LA-B906-MS LA-B908-MS LA-B90	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-12241*# 1063 N82-15488*# 1063 N82-10502*# 1063 N82-10500*# 1063 N82-10500*# 1063 N82-11540*# 1064 N82-11548*# 1065 N82-11548*# 1066 N82-11549*# 1068 N82-11145*# 1068 N82-11145*# 1068 N82-11194**# 1068 N82-111994*# 1068 N82-11550*# 1068 N82-11550*# 1068 N82-11550*# 1068 N82-11550*# 1068 N82-11550*# 1068 N82-11550*# 1068 N82-1156*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCG97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0C65 N8 LA-UR-81-2186 p0C70 N8 LA-UR-81-2200 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0070 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0 144 N8 LA-UR-81-2628 p0C82 N8 LA-UR-81-2628 p0C82 N8 LA-UR-81-2628 p0C82 N8 LA-UR-81-2628 p0074 N8 <td< td=""><td>NASA-CASE-NPO-14273-1</td><td>1107 N82-1240*# 1063 N82-10496*# 1107 N82-1241*# 1107 N82-1244*# 1109 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-10504*# 1066 N82-11544*# 1067 N82-11544*# 1068 N82-11546*# 1098 N82-11146*# 1098 N82-11145*# 1016 N82-11594*# 1016 N82-11594*# 1016 N82-11550*# 1014 N82-11516*# 1020 N82-12657*# 1020 N82-12657*# 1020 N82-12657*# 1020 N82-12658*#</td></td<>	NASA-CASE-NPO-14273-1	1107 N82-1240*# 1063 N82-10496*# 1107 N82-1241*# 1107 N82-1244*# 1109 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-10504*# 1066 N82-11544*# 1067 N82-11544*# 1068 N82-11546*# 1098 N82-11146*# 1098 N82-11145*# 1016 N82-11594*# 1016 N82-11594*# 1016 N82-11550*# 1014 N82-11516*# 1020 N82-12657*# 1020 N82-12657*# 1020 N82-12657*# 1020 N82-12658*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 pC65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-2186 p0070 N8 LA-UR-81-2250 p0074 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2288 p0070 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 p0744 N8 LA-UR-81-2628 p0744 N8 LA-UR-81-2628 p0744 N8 LA-UR-81-2628 p074 N8 LA-UR-81-2628 p075 N8 LA-UR-81-2628 p076 N8 LA-UR-81-2628 p077 N8 LA-UR-81-2628 p076 N8	NASA-CASE-NPO-14273-1	107 N82-1240*# 1063 N82-1244*# 107 N82-1244*# 107 N82-1244*# 1030 N82-12648*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 1066 N82-11544*# 1066 N82-11548*# 1067 N82-11548*# 1068 N82-11548*# 1098 N82-1146** 1016 N82-11994*# 1016 N82-11994*# 1016 N82-1156*# 1004 N82-1156*# 1004 N82-1156*# 1004 N82-13658*# 10020 N82-13658*# 10026 N82-13981*# 10076 N82-1398**
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0C65 N8 LA-UR-81-2186 p0C70 N8 LA-UR-81-2200 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2595 p0 112 N8 LA-UR-81-2628 p0 112 N8 LA-UR-81-2628 p0 144 N8 LA-UR-81-2628 p0 106 N8 LA-8992-T p0 074 N8 LA-8996-MS p0 074 N8 LA-8992-MS p0 075 N8 LA-8932-PR p0 0025 N8 LA-8954-MS p0 106 N8 LBL-9963-REV p0 106 N8	NASA-CASE-NPO-14273-1	1107 N82-1240*# 1063 N82-10496*# 1107 N82-12445*# 1159 N82-12445*# 1030 N82-1250*# 1063 N82-10504*# 1063 N82-10504*# 1063 N82-10504*# 1063 N82-10504*# 1063 N82-10500*# 1063 N82-11548*# 1064 N82-11548*# 1068 N82-11548*# 1068 N82-11549*# 1068 N82-11549*# 1068 N82-11550*# 1016 N82-11994*# 1016 N82-11516*# 1016 N82-11516*# 1010 N82-11516*# 1020 N82-12657*# 1020 N82-12658*# 1020 N82-12658*# 1020 N82-13494*# 1021 N82-13494*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0C65 N8 LA-UR-81-2186 p0C70 N8 LA-UR-81-2200 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2595 p0 112 N8 LA-UR-81-2628 p0 112 N8 LA-UR-81-2628 p0 144 N8 LA-UR-81-2628 p0 106 N8 LA-8992-T p0 074 N8 LA-8996-MS p0 074 N8 LA-8992-MS p0 075 N8 LA-8932-PR p0 0025 N8 LA-8954-MS p0 106 N8 LBL-9963-REV p0 106 N8	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-12241*# 1059 N82-15488*# 1063 N82-10502*# 1063 N82-10502*# 1063 N82-10504*# 10663 N82-11549*# 10663 N82-11549*# 10660 N82-11549*# 1068 N82-11549*# 1068 N82-11145*# 1068 N82-11294*# 1068 N82-11594*# 1068 N82-11550*# 1014 N82-11516*# 1016 N82-11516*# 1016 N82-12657*# 1020 N82-12657*# 1020 N82-12658*# 1020 N82-13493*# 1024 N82-13493*# 1024 N82-13493*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p138 N8 LA-UR-81-1265 pCG97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-2286 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8 LA-UR-81-2380 p0150 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 p0C82 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2795 p0144 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-268 pCC82 N8 LA-UR-81-27 p0074 N8 LA-UR-81-268 pCC82 N8 LA-UR-81-269 pCC82 N8 LA-UR-81-269 pCC82 N8 LA-UR-81-261 pCC82 N8 LA-UR-81-2628 pCC82 N8	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1003 N82-10496*# 1107 N82-12241*# 1159 N82-15488*# 1003 N82-15488*# 10063 N82-10502*# 10063 N82-10502*# 10063 N82-10500*# 1018 N82-11549*# 1018 N82-11549*# 1018 N82-11146*# 1019 N82-11549*# 1016 N82-11549*# 1016 N82-11549*# 1016 N82-1150*# 1010 N82-11516*# 1010 N82-12657*# 1010 N82-12657*# 1010 N82-13495*# 1010 N82-13495*# 1010 N82-13495*# 1010 N82-13495*# 1010 N82-13495*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 pC65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-22186 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N6 LA-UR-81-2595 p0 144 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2795 p0 144 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0075 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-892-T p0075 N8 LA-8932-PR p0025 N8 LA-893	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1063 N82-10496*# 1107 N82-12241*# 1159 N82-12241*# 1059 N82-12445*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 10663 N82-10504*# 1067 N82-11548*# 1068 N82-11548*# 1068 N82-11548*# 1068 N82-11145*# 1068 N82-11145*# 1068 N82-11194**# 1068 N82-1150*# 1068 N82-1150*# 1068 N82-1150*# 1068 N82-11349** 1068 N82-11516*# 1068 N82-13491*# 1076 N82-13495*# 1076 N82-13495*# 1076 N82-13491*#
LA-UR-81-852 LA-UR-81-1054 LA-UR-81-1265 LA-UR-81-1750 LA-UR-81-1806 LA-UR-81-1807 LA-UR-81-1807 LA-UR-81-1906 LA-UR-81-2162 LA-UR-81-2185 LA-UR-81-2185 LA-UR-81-2186 LA-UR-81-2250 LA-UR-81-2251 LA-UR-81-2252 LA-UR-81-2252 LA-UR-81-2252 LA-UR-81-2253 LA-UR-81-2253 LA-UR-81-2254 LA-UR-81-2255 LA-UR-81-2255 LA-UR-81-2258 LA-UR-81-2258 LA-UR-81-2258 LA-UR-81-2259 LA-UR-81-2259 LA-UR-81-2628 LA-	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1107 N82-12445*# 1107 N82-1241*# 1159 N82-12445*# 1030 N82-15488*# 1063 N82-10502*# 1063 N82-10504*# 10663 N82-10504*# 1067 N82-11544*# 1067 N82-11548*# 1066 N82-11548*# 1098 N82-11146*# 1098 N82-11145*# 1098 N82-11594*# 1006 N82-11594*# 1006 N82-11594*# 1006 N82-11549*# 1006 N82-11549*# 1006 N82-13493*# 1006 N82-13493*# 10076 N82-13491*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCG97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-2286 p0C70 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2253 p0070 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2795 p0144 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-8992-T p0074 N8 LA-8932-PR p0027 N8 LA-8932-PR p0027 N8 LA-8934-MS p0105 N8 LBL-11090 p015 N8 LBL-11090 p015 N8 LBL-11090 p0081 N8 LBL-11008 p0	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1107 N82-12241*# 1107 N82-1241*# 1107 N82-1241*# 1109 N82-15488*# 1100 N82-15488*# 1100 N82-10502*# 1100 N82-10502*# 1100 N82-10504*# 1100 N82-11548*# 1100 N82-11548*# 1100 N82-11548*# 1100 N82-11548*# 1100 N82-11548*# 1100 N82-1150*# 1100 N82-1150*# 1100 N82-1150*# 1100 N82-12657*# 1100 N82-13981*# 1100 N82-13495*# 1100 N82-13495*# 1100 N82-13495*# 1100 N82-13495*# 1100 N82-13495*# 1100 N82-13491*# 1100 N82-13501*# 1100 N82-13631*# 1100 N82-14631*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-2286 p0C70 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2258 p0070 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2628 p0074 N8	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1107 N82-12445*# 1107 N82-1241*# 1109 N82-12441*# 1109 N82-12445*# 1100 N82-10501*# 1100 N82-10501*# 1100 N82-10502*# 1100 N82-10504*# 1100 N82-10504*# 1100 N82-115489*# 1100 N82-11548*# 1100 N82-13493*# 1100 N82-134631*# 1100 N82-14630*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-2107 p0119 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-2186 p0070 N8 LA-UR-81-2200 p0074 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 p0077 N8 LA-UR-81-2628 p0070 N8 LA-UR-81-2795 p0144 N8 LA-UR-81-2628 p0077 N8 LA-B929-MS p0077 N8 LA-8932-PR p0025 N8 LA-8932-PR p0025 N8 LB-11029 p0159 N8 LB-11090 p0159 N8 LB-11090 p0159 N8 LBL-11387 p0082 N8 LBL-12048 p00	NASA-CASE-NPO-14273-1	1107 N82-1240*# 1063 N82-10496*# 1107 N82-1241*# 1159 N82-12445*# 1063 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 10663 N82-10504*# 1067 N82-11544*# 10663 N82-11544*# 1068 N82-11546*# 1068 N82-11145*# 1068 N82-11145*# 1068 N82-11156*# 1068 N82-11550*# 1068 N82-11556*# 1004 N82-12657*# 10020 N82-12657*# 10020 N82-13495*# 10020 N82-14631*# 10020 N82-14631*# 10020 N82-14631*# 10020 N82-14550
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0C65 N8 LA-UR-81-2186 p0C70 N8 LA-UR-81-2200 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 p012 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0144 N8 LA-UR-81-2628 p0144 N8 LA-UR-81-2628 p0150 N8 LA-8992-T p0074 N8 LA-8932-PR p0025 N8 LA-8932-PR p0025 N8 LA-8932-PR p0025 N8 LB-11029 p0159 N8 LB-11090 p0159 N8 LBL-11090 p0158 N8 LBL-12640 p00	NASA-CASE-NPO-14273-1	107 N82-1240*# 1063 N82-10496*# 107 N82-1241*# 107 N82-1241*# 1059 N82-12445*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 1063 N82-10504*# 1066 N82-11544*# 1067 N82-11546*# 1068 N82-11546*# 1068 N82-11546*# 1068 N82-11145** 1066 N82-11994*# 1066 N82-11994*# 1066 N82-1156*# 1004 N82-1156*# 1004 N82-12657*# 1004 N82-13495*# 1006 N82-13495*# 10076 N82-13495*# 10076 N82-13495*# 1076 N82-13491*# 1076 N82-13491*# 1076 N82-13491*# 1076 N82-13493*# 1076 N82-13493*# 1076 N82-13493*# 1076 N82-13495*# 1076 N82-13495*# 1076 N82-13495*# 10778 N82-14630*# 1078 N82-14630*# 1079 N82-14520 # 1079 N82-14526*# 1079 N82-14526*# 1079 N82-14526*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCG97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0665 N8 LA-UR-81-2286 p0C70 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 pCC82 N8 LA-8992-T p0074 N8 LA-8932-PR p0025 N8 LA-8932-PR p0025 N8 LA-8932-PR p0025 N8 LB-11029 p0158 N8 LBL-11048 p0081 N8 LBL-11387 p0082 N8 LBL-12048 p0081 N8 LBL-12049 p0158	NASA-CASE-NPO-14273-1	107 N82-1240*# 1063 N82-10496*# 1107 N82-1241*# 1107 N82-12445*# 1030 N82-15488*# 1030 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 1066 N82-11544*# 1067 N82-11544*# 1067 N82-11546*# 1068 N82-11548*# 1098 N82-1146*# 1016 N82-11994*# 1016 N82-11546*# 1016 N82-11550*# 1014 N82-11516*# 1020 N82-12657*# 1020 N82-12657*# 1020 N82-13495*# 1021 N82-13495*# 1021 N82-13495*# 1022 N82-13495*# 1023 N82-13495*# 1024 N82-13495*# 1025 N82-13495*# 1026 N82-13495*# 10276 N82-13495*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-2160 pCC66 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-2286 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0 144 N8 LA-UR-81-2628 p0023 N8 LA-UR-81-2628 p0044 N8 LA-UR-81-2795 p0 144 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0150 N8 LA-UR-81-2628 p0150 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0150 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0150 N8 <t< td=""><td>NASA-CASE-NPO-14273-1</td><td>1107 N82-1240** 1107 N82-1240** 1107 N82-1241** 1159 N82-12445** 1030 N82-15488** 1063 N82-10501** 1063 N82-10502** 1063 N82-10504** 1063 N82-10500** 1063 N82-10500** 1063 N82-10500** 1063 N82-11548** 1064 N82-11548** 1068 N82-11548** 1068 N82-11548** 1068 N82-11549** 1068 N82-1150** 1068 N82-11550** 1076 N82-11550** 1020 N82-12657** 1020 N82-13495** 1020 N82-13495** 1024 N82-13495** 1026 N82-13495** 10276 N82-13495** 10276 N82-13491** 1076 N82-13491** 1076 N82-13491** 1076 N82-13491** 1076 N82-13491** 1076 N82-13491** 10776 N82-13491** 10776 N82-13491** 10778 N82-14631** 1078 N82-14630** 1079 N82-14630** 1079 N82-14630** 1078 N82-14630**</td></t<>	NASA-CASE-NPO-14273-1	1107 N82-1240** 1107 N82-1240** 1107 N82-1241** 1159 N82-12445** 1030 N82-15488** 1063 N82-10501** 1063 N82-10502** 1063 N82-10504** 1063 N82-10500** 1063 N82-10500** 1063 N82-10500** 1063 N82-11548** 1064 N82-11548** 1068 N82-11548** 1068 N82-11548** 1068 N82-11549** 1068 N82-1150** 1068 N82-11550** 1076 N82-11550** 1020 N82-12657** 1020 N82-13495** 1020 N82-13495** 1024 N82-13495** 1026 N82-13495** 10276 N82-13495** 10276 N82-13491** 1076 N82-13491** 1076 N82-13491** 1076 N82-13491** 1076 N82-13491** 1076 N82-13491** 10776 N82-13491** 10776 N82-13491** 10778 N82-14631** 1078 N82-14630** 1079 N82-14630** 1079 N82-14630** 1078 N82-14630**
LA-UR-81-852 LA-UR-81-1054 LA-UR-81-1265 LA-UR-81-1750 LA-UR-81-1806 LA-UR-81-1807 LA-UR-81-1906 LA-UR-81-2182 LA-UR-81-2182 LA-UR-81-2185 LA-UR-81-2185 LA-UR-81-2252 LA-UR-81-2252 LA-UR-81-2252 LA-UR-81-2252 LA-UR-81-2258 LA-UR-81-2365 LA-UR-81-2365 LA-UR-81-2595 LA-UR-81-2628 LA-	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1107 N82-1241*# 1159 N82-1241*# 1159 N82-1241*# 1159 N82-15488*# 10030 N82-15488*# 10063 N82-10502*# 10063 N82-10504*# 10063 N82-10504*# 10063 N82-11544*# 10067 N82-11548*# 10068 N82-11549*# 10068 N82-11149*# 10068 N82-11149*# 10068 N82-11149*# 10068 N82-1150*# 10068 N82-1150*# 10068 N82-1150*# 10068 N82-11550*# 10068 N82-11549*# 10068 N82-11394*# 10068 N82-11394*# 10068 N82-11516*# 10068 N82-11516*# 10068 N82-11516*# 10068 N82-11516*# 10068 N82-11550*# 10068 N82-13491*# 10078 N82-13491*# 10078 N82-13491*# 10078 N82-13491*# 10078 N82-14630*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pC666 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-2186 p0C70 N8 LA-UR-81-2200 p0074 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2795 p0144 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-8992-T p0074 N8 LA-8932-PR p0025 N8 LA-8932-PR p0025 N8 LBL-11090 p015 N8 LBL-12048	NASA-CASE-NPO-14273-1	1107 N82-12240*# 1107 N82-1241*# 1107 N82-1241*# 1109 N82-1241*# 1109 N82-12445*# 10030 N82-15488*# 10063 N82-10502*# 10063 N82-10504*# 10063 N82-10504*# 10063 N82-11544*# 10063 N82-11548*# 10063 N82-11548*# 10063 N82-11548*# 10068 N82-11549*# 10098 N82-11145*# 10098 N82-11145*# 10098 N82-11150*# 10068 N82-1150*# 10068 N82-1150*# 10068 N82-1150*# 10068 N82-11349*# 10068 N82-11349*# 10068 N82-13493*# 10068 N82-13493*# 10076 N82-13493*# 10078 N82-14631*# 10078 N82-14630*# 10078 N82-14630*# 10078 N82-14630*# 10078 N82-14636*# 10078 N82-14636*# 10078 N82-14636*# 10078 N82-14636*# 10078 N82-14636*# 10078 N82-14636*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCG97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2162 p0C65 N8 LA-UR-81-2185 p0065 N8 LA-UR-81-2286 p0070 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2795 p0144 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2795 p0144 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2628 pCC82 N8 LA-UR-81-2795 p016 N8 LA-8929-MS p0027 N8 LA-8932-PR p0025 N8 LA-8954-MS p0105 N8 LBL-11029<	NASA-CASE-NPO-14273-1	1107 N82-1240** 1107 N82-1240** 1107 N82-1241** 1159 N82-12445** 1030 N82-10501** 1063 N82-10501** 1063 N82-10504** 1063 N82-10504** 1063 N82-10504** 1063 N82-10504** 1063 N82-10504** 1063 N82-10504** 1066 N82-11548** 1068 N82-11548** 1068 N82-11548** 1068 N82-11548** 1068 N82-11549** 1068 N82-1150** 1016 N82-11145** 1016 N82-11516** 1020 N82-12657** 1020 N82-12657** 1020 N82-13491** 1021 N82-13495** 1024 N82-13495** 1026 N82-13491** 10278 N82-14631** 1028 N82-14631** 1029 N82-14631** 1038 N82-14631** 104 N82-14631** 1078 N82-14631** 1078 N82-14631** 1078 N82-14631** 1078 N82-14631** 1078 N82-14633**
LA-UR-81-852 LA-UR-81-1054 LA-UR-81-1265 LA-UR-81-1750 LA-UR-81-1806 LA-UR-81-1807 LA-UR-81-1906 LA-UR-81-2162 LA-UR-81-2162 LA-UR-81-2185 LA-UR-81-2186 LA-UR-81-2250 LA-UR-81-2251 LA-UR-81-2252 LA-UR-81-2380 LA-UR-81-2380 LA-UR-81-2628 LA-	NASA-CASE-NPO-14273-1	1107 N82-1240*# 1063 N82-1046*# 1107 N82-1241*# 1109 N82-12445*# 1030 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 10663 N82-10504*# 10663 N82-10504*# 1067 N82-11544*# 1067 N82-11546*# 1068 N82-11546*# 1068 N82-11146*# 1068 N82-11145*# 1068 N82-11145*# 1068 N82-11550*# 1068 N82-11550*# 1076 N82-13495*# 1076 N82-13493*# 1077 N82-13501*# 1078 N82-14630*# 1079 N82-13526*# 1078 N82-14637*# 1079 N82-14637*# 1079 N82-14637*# 1079 N82-13506*# 1079 N82-13490*# 1079 N82-13490*# 1079 N82-13526*# 1078 N82-14637*# 1079 N82-13490*# 1079 N82-13506*# 1079 N82-13506*# 1079 N82-13490*# 1079 N82-14637*# 1142 N82-13510*# 1142 N82-13510*#
LA-UR-81-852 pCC57 N8 LA-UR-81-1054 p0138 N8 LA-UR-81-1265 pCC97 N8 LA-UR-81-1750 p0139 N8 LA-UR-81-1806 p0119 N8 LA-UR-81-1807 p0119 N8 LA-UR-81-1906 pCC86 N8 LA-UR-81-2185 p0C65 N8 LA-UR-81-2186 p0C65 N8 LA-UR-81-2286 p0C70 N8 LA-UR-81-2251 p0070 N8 LA-UR-81-2252 p0070 N8 LA-UR-81-2288 p0023 N8 LA-UR-81-2365 p0150 N8 LA-UR-81-2380 p0112 N8 LA-UR-81-2595 p0144 N8 LA-UR-81-2628 p0023 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2795 p0144 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0074 N8 LA-UR-81-2628 p0150 N8 LA-UR-81-2628 p0144 N8 LA-UR-81-2628 p0150 N8 LA-UR-81-2628 p0150 N8 LA-UR-81-2628 p0150 N8 LA-UR-81-2628 p0150 N8 LA-UR-81-2628 p0027 N8	NASA-CASE-NPO-14273-1	1107 N82-1240*# 1063 N82-1046*# 1107 N82-1241*# 1109 N82-12445*# 1030 N82-15488*# 1063 N82-10501*# 1063 N82-10502*# 1063 N82-10504*# 10663 N82-10504*# 10663 N82-10504*# 1067 N82-11544*# 1067 N82-11546*# 1068 N82-11546*# 1068 N82-11146*# 1068 N82-11145*# 1068 N82-11145*# 1068 N82-11550*# 1068 N82-11550*# 1076 N82-13495*# 1076 N82-13493*# 1077 N82-13501*# 1078 N82-14630*# 1079 N82-13526*# 1078 N82-14637*# 1079 N82-14637*# 1079 N82-14637*# 1079 N82-13506*# 1079 N82-13490*# 1079 N82-13490*# 1079 N82-13526*# 1078 N82-14637*# 1079 N82-13490*# 1079 N82-13506*# 1079 N82-13506*# 1079 N82-13490*# 1079 N82-14637*# 1142 N82-13510*# 1142 N82-13510*#

NASA-CR-165452-VOL-3 p0137 N82-10495*#	PB81-215014	
NASA-CR-165453 pC144 N82-15527*#	PB81-216095	
WASA-CR-165477 p0077 N82-14627*#	PB81-216103	
NASA-CR-165508 p0157 N82-11547*#	PB81-216111	
NASA-CR-165512 p0140 N82-12572*#	PB81-216129 p0013 N82-11525	#
NASA-CR-165513 p0114 N82-14371*#	PB81-217614	
NASA-CR-165517	PB81-218141	*
NASA-CR-166265 p0075 N82-13039*# }	PB81-218471	#
-		#
NASA-NEWS-RELEASE-81-199 p0161 N82-15008*	PB81-219487	
	PB81-219495	i
NASA-TM-58237-VOL-4 p0C78 N82-14634*#	PB81-219594	i
NASA-TH-58238-VOL-7		į
NASA-TH-76609	PB81-221301	1
NASA-TH-76610 p0C86 N82-11223*#		I
NASA-TM-81616	PB81-222267	
NASA-TM-82594		
NASA-TM-82620	PB81-222309	*
NASA-TM-82685		
NASA-TM-82705	PB81-222333	
NASA-TH-82709 p0155 N82-10503*#	PB81-222424	*
NASA-TH-82724 p0159 N82-12574*#	PB81-222612	#
NASA-TM-82726		
NASA-TM-82727	PB81-222804	
BASA-TM-82744		
NASA-TM-83175		
NASA-TM-84064		ž
NASA-TH-84079	PB81-224982	ž
NASA-TP-1955		#
MADE-IE-1333 -5	PB81-225773	;
-0464 900 45936 8		
NBS-DIM-65-3	The state of the s	#
		#
NBSIR-80-2178-DOB	PB81-226862 p0014 N82-11624	*
NBSIR-81-2293 p0138 N82-11173 #	PB81-226979	#
NBSIR-81-2300	PB81-227886	#
	PB81-228256	#
NCBI-0031 p0070 N82-11615 #	PB81-228488	#
	PB81-229262	#
NOAA-TM-ERL-OWRM-3	PB81-229866	#
		#
NOAA-81052107		
NOAA-81062609		ě
	PB81-231698	ā
NP-1903916		•
NP-1903997 p0072 N82-12599 #		ě
NP-1904010-PT-1		ŧ
NP-1904014 p0 104 N82-11520 #		Ŧ.
NP-1904016	PB81-233025	•
MF-1904010		#
NOT 1771 00 07 4407		#
NSF/PRA-80-SP-1187 p0071 N82-11623 #		#
	PB81-233850 p0026 N82-13986	*
NTIA/REPT-81/75 p0150 N82-13157 #		#
	PB81-233918	#
NYSERDA-80-24 p0071 N82-11625 #	Proceedings and the contract of the contr	#
NYSERDA-81-2	PB81-234239	#
NYSERDA-81-7 p0011 N82-11275 #	PB81-235053	#
	PB81-235681	#
ORAU-182	PB81-238248	#
ORAU-185	PB81-238479	#
	PB81-240061	
ORAU/IEA-81-6(M) p0025 N82-13558 #	PB81-240186	
* * * * * * * * * * * * * * * * * * * *	PB81-240319	
ORNL-5750	PB81-240442	
ORNL-5784	PB81-240467	
ORNL-5806	PB81-243156	
year	PB81-243164	
ORNL/EIS-171 p0C08 N82-10585 #	PB81-244030	
ORNL/HIT-331		
ORNL/MIT-332 p0021 N82-12674 #	PB81-244048	
	PB81-244774	
ORNL/SUB-80/40416/1 p0031 N82-15553 #	PB81-245045	
ORNL/SUB-80/61602/1 p0012 N82-11321 #	PB81-245839	
ORNL/TH-7664 p0117 N82-15221 #	PB81-246316	
ORNL/TH-7718 p0G07 N82-10561 #	PB81-246522	
ORNL/TM-7724 p0117 N82-15222 #	PB81-246712 p0034 N82-15633	
OBNL/TH-7787 p0025 N82-13560 #	FB81-247520 p0034 N82-15618	#
ORNL/TH-7847 p0098 N82-11151 #		_
ORNL/TH-7852 p0103 N82-11405 #	PFC/RR-81-6	#
ORNL/TH-7915 p0111 N82-13245 #	-	
	PML-1979-41	#
OWRT-B-061-NMRX (1) p0021 N82-12680 #	FML-1980-06	
•		
P-101-12/A-101-4 p0081 N82-15563 #	FNL-SA-8881 p0029 N82-14910	#
P-103-4 p0C81 N82-15564 #	FNL-SA-9049	
•	PNI-SA-9149	
PB81-209215 p0021 N82-12680 #	FNL-SA-9164	
PB81-213233	PNL-SA-9246 p0117 N82-15226	
PB81-214132	PNL-SA-9292	
arrive to the contract of the contract o		-

PNL-SA-9411 p0C97 N82-10655 #	SAND-81-7014-VOL-3 p0069 N82-11567 #
PNL-SA-9516	SAND-81-7014-VOL-4
PNL-SA-9606	SAND-81-7014-VOL-5
PNL-SA-9618	SAND-81-7085/1 p0065 N82-10543 #
PNL-SA-9780 p0160 H82-15548 #	SAND-81-7088-2 p0077 N82-13532 #
PNL-SA-9782p0160 N82~15510 #	SAND-81-7100-VOL-1 p0072 H82-12602 #
DNY 2645	SAND-81-7123 p0112 N82-13520 #
PNL-3645	SAND-81-8177-VOL-1 p0069 N82-11564 #
PNL~3769	SAND-81-8232
PNL~3864	SAND-81-8236
PNL-3863	3889-01-0230 ***********************************
PNL~3924	SERI/PR-0-9010-2 p0068 H82-11557 #
PNL-3933	SERI/PR-0-9010-3 p0068 N82-11558 #
PNL-3951	SERI/PR-8062-1-T12 p0069 N82-11577 #
PNL-4013p0025 N82-13567 #	SERI/PR-9131-1-T3 p0066 N82-10569 #
PNL-4018	SERI/PR-9175-1-T3 p0066 N82-10568 #
	SERI/PR-9233-1-T1 p0065 N82-10539 #
POLY-M/AE-81-8 p0C99 H82-11158 #	SERI/PR-9318-1-T2 p0063 N82-10507 #
	SERI/RR-742-1068
PSI-TR-280 p0093 N82-10158 #	SERI/SP-751-902 p0095 N82-10263 #
₽SI-TR-284 pCC93 N82-10155 #	SERI/TP-233-1388
D01 10203	SERI/TP-253-1369
P81-10203 p0161 N82-15008*	SERI/TP-614-1216 p0070 N82-11609 #
QPR-3p00C8 N82-10586 #	SERI/TP-620-1344
QPR-3 p0006 862-10566 #	SERI/TP-631-1163
844-2 ***********************************	SERI/TP-632-1287 p0070 N82-11606 #
QR-1	SEEL/TP-634-1195
QR-1 p0098 882-11148 #	SERI/TP-634-1282
QR-1	SERI/TP-634/1215
QR-2p0092 N82-10144 #	SERI/TP-641-1222 p0066 N82-10563 #
QR-2 pCC99 N82-11164 #	SERI/TP-721-1138R p0081 N82-15544 #
QR-3p0093 N82-10155 #	SERI/TP-721-1167R p0074 N82-12628 #
QR-3p0066 N82~10569 #	SERI/TP-721-1300 p0017 N82-12283 #
QR-3p0014 N82-11641 #	SERI/TP-721-1317 p0074 N82-12627 #
QB-3 p0076 N82-13496*#	SERI/TP-721-1325 p0074 N82-12626 #
QB+3p0G78 N82-14630*#	SERI/TP-721-1342
QR-10 p0069 N82~11577 #	SERI/TP-733-1278 p0081 N82-15545 #
ODDD 3	SERI/TR-632-870
QRPR-3 p0092 N82-10150 #	SERI/TR-721-1119 p0075 N82-13265 #
QTPR-2 p0068 N82~11557 #	SERI/TR-721-1161
QTPR-3	SERI/TR-733-790R-VCL-3 p0004 H82-10512 #
QTPR-3 p0101 N82-11242 #	SERI/TR-734-900 p0007 882-10344 \$ SERI/TR-734-900 p0110 N82-12633 \$
QTPR-3 p0068 N82-11558 #	SERI/TR-742-885
QTPR-3	SERI/TR-8085-3-T1
QTPR-3	SERI/TR-98252-1B
	SERI/TR-98288-1 p0067 N82-11407 #
QTR-3236	SENI/TE-98356-1
QTSR-7 p0C97 N82-10938 #	SOLAR/0010-81/08 p0075 N82-12707 #
7777 42	SOLAR/1041-81/14 p0068 N82-11560 #
REPT-13 p0023 N82-13435 #	SOLAE/1045-80/14
#EPT-80-24	SOLAR/1046-81/50 p0064 N82-10511 # SOLAR/1051-81/50 p0064 N82-10510 #
REPT-111-2401-204	SOLAR/1051-81/50
REPT-646-1-80-12 p0023 N82-13267 #	SOTREAL 1004-01/20 50002 HOS-10303 #
REPT-1007	SP-RAPP-1979/4 p0077 N82-13548 #
REPT-1378-11-1-2482 p0027 N82-14071 #	of anti-things effective effects poor, not 15540 F
KEPT-8100-FB-0003 p0104 N82-11571 #	SSRI-81-2
REPT-97649-E005-U1-02	•
-	SU-SUPRI-TR-25 p0098 N82-11153 #
RISO-M2241 p0C75 N82~12644 #	
ED_64# 74	TB-1654 p0079 N82-14668 #
RR-614.71 p0025 N82-13553 #	TDCK-73390 p0032 N82-15596 #
RTI/1934/00-01F	TDCK-73390
RTI/1934/00-03F p0013 N82-11661 #	дын 1993 - ••••• - • • • • • • • • • • • • • •
224/1554/00-051 411111111111111111111111111111111111	TPS-79-743 p0009 N82-10594 #
SAI-444-80-533-LJ	115 /5 /45 *******************************
	TR-3 p0139 N82-11934 #
SAND-79-8279-VOL-1	TE-81-C-29
SAND-80-0385	·
SAND-80-8049	UCID-19199 p0077 N82-13543 #
SAND-81-0043	
SAND-81-0369 p0071 N82-11617 #	UCBL-15372p0156 N82-10535 #
SAND-81-0715C p0113 N82-14323 #	UCRL-50026-81-1
SAND-81-0923	UCRL-50056-80
SAND-81-1156	UCBL-52000-81-7
SAND-81-1164C	UCRL-53121 p0010 N82-11263 #
SAND-81-1180-PT-1 p0073 N82-12616 #	UCRL-53131 p0035 N82-15833 #
SAND-81-1187	UCRL-53179
SAND-81-1384C	UCRL-85035
SAND-81-1541	UCRL-85526
SAND-81-7011	UCRL-85839
SAND-81-7014-VOL-1 p0C69 N82-11566 #	UCRL-85852 p0102 N82-11248 #
SAND-81-7014-VOL-2 p0C69 N82-11566 #	UCRL-85919
	-

UCRL-86260		p0C67	N82-11247 #	
UCRL-86257		p0158	N82-11596 #	
UCRL-86437		p0015	N82-11712 #	
UCRL-86515		p0117	N82-15227 #	
UCRL-86518		D0116	N82-14613 #	
UCRL-86557		p0159	N82-14655 #	
0CVT-00331	••••••	PO 123	B02-14033 #	
HC_DAMPUG_AF	PPL-SN-202228	p0139	N82~11399*#	
	PPL-SN-284286	p0063	N82-10496+#	
	PPL-SN-315584		N82~12241*#	
	PPL-SN-315587		N82-12240*#	
US-PATENT-AI	PPL-SN-969759	pCC97	N82-11144*	
US-PATENT-CI			¥82~11144*	
US-PATENT-CI		p0C97	N82-11144*	
US-PATENT-CI	LASS-110-255	p0C97	N82-11144*	
US-PATENT-CI	ASS-110-266	p0097	N82-11144+	
US-PATENT-CI	ASS-122-4D	pCC97	N82~11144*	
		-		
US-PATENT-4	.287.838	pCC97	N82-11144*	
		F - • • •		
USCG-D-06-81	l	n0024	N82-13512 #	
		P00-1	15512 7	
USGS-CIRC-83	37	n0110	N92-12693 #	
0000-0140-00	,,	POTTO	H02-12033 \$	
Here Juph Jup	I-81-073 ·····	-0020	N82-15624 #	
USGS/WRI-81-	.16			
0262/#XT-91-	10	PUU34	N82-15624 #	
75H1 75 00 4	2000	-0006	WOO 4366# #	
UTBA-1T-09-(00890-81-1	P0026	N82-13984 #	
UTRC-81-9153	326-15	p0114	N82-14371*#	
	•			
VBDA-43905-8	30U/F0069	p0064	N82-10516 #	
'				
VTT-56		p0075	N82-12644 #	
WRRI-128		p0021	N82-12680 #	
W81-03269 .		D0021	N82-12680 #	
		• ,	, ,	
Y/DX-290		n0157	N82-10549 #	
-,		20101	MUS - 10J73 P	

Report No. NASA SP-7043 (33)	2 Government Access	on No	3. Recipient's Catalog	No.	
Title and Subtitle ENERGY	(1 00)		5. Report Date April 1982		
A Continuing Bibliography (Issue 33)			6. Performing Organiz	. Performing Organization Code	
. Author(s)			8. Performing Organiza	ation Report No	
National Aeronautics and Washington, D.C. 20546	d Space Administ	_			
. Performing Organization Name and Address			10. Work Unit No.		
		-	11. Contract or Grant	No.	
			13. Type of Report an	d Period Covered	
. Sponsoring Agency Name and Address		_			
		.	14. Sponsoring Agency	Code	
5. Supplementary Notes					
5. Abstract					
This bibliography	lists 1211 repo	rts, articles, and	other document	s	
	ne NASA scientif	ic and technical i			
,	-				
7. Key Words (Suggested by Author(s))		18. Distribution Statement			
Bibliographies Energy Conversion					
Energy Policy		Unclassified -	- Unlimited		
Solar Energy Wind Energy					
9. Security Classif. (of this report)	20 Security Classif (c		21. No. of Pages 382	22. Price* \$15.00 HC	
Unclassified		3	. ,		

^{*}For sale by the National Technical Information Service, Springfield, Virginia 22161

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA

University of California, Berkeley

COLORADO

University of Colorado, Boulder

DISTRICT OF COLUMBIA

Library of Congress

GEORGIA

Georgia Institute of Technology, Atlanta

ILLINOIS

The John Crerar Library, Chicago

MASSACHUSETTS

Massachusetts Institute of Technology, Cambridge

MISSOURI

Linda Hall Library, Kansas City

NEW YORK

Columbia University, New York

OKLAHOMA

University of Oklahoma, Bizzell Library

PENNSYLVANIA

Carnegie Library of Pittsburgh

WASHINGTON

University of Washington, Seattle

NASA publications (those indicated by an '*' following the accession number) are also received by the following public and free libraries:

CALIFORNIA

Los Angeles Public Library San Diego Public Library

COLORADO

Denver Public Library

CONNECTICUT

Hartford Public Library

MARYLAND

Enoch Pratt Free Library, Baltimore

MASSACHUSETTS

Boston Public Library

MICHIGAN

Detroit Public Library

MINNESOTA

Minneapolis Public Library and Information

Center

NEW JERSEY

Trenton Public Library

NEW YORK

Brooklyn Public Library

Buffalo and Erie County Public Library

Rochester Public Library New York Public Library

оню

Akron Public Library

Cincinnati and Hamilton County Public Library

Cleveland Public Library Dayton Public Library

Toledo and Lucas County Public Library

TEXAS

Dallas Public Library

Fort Worth Public Library

WASHINGTON

Seattle Public Library

WISCONSIN

Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy of microfiche of NASA and NASA-sponsored documents, those identified by both the symbols '#' and '*', from. ESA - Information Retrieval Service, European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France

National Aeronautics and Space Administration

Washington, D.C. 20546

Official Business
Penalty for Private Use, \$300

SPECIAL FOURTH CLASS MAIL Book

Postage and Fees Paid National Aeronautics and Space Administration NASA-451





POSTMASTER If Undeliverable (Section 158
Postal Manual) Do Not Return